The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XXIII. No. 597 DECEMBER 6, 1930 Prepaid Annual Subscription: United Kingdom, £1 1.0; Abroad, £1.6.0

Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders, and Postal Orders should be made payable to Benn Brothers, Ltd.*

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Telegrams: "Allangas, Fleet, London." Telephone: City 0244

A Central Chemistry House

WE are glad to publish on p. 525 the letter that Professor Thorpe has been good enough to send us, because it removes a misapprehension that inadvertently might be conveyed—and, indeed, appears to have been conveyed, though this was far from our intention—by some observations in THE CHEMICAL AGE of last week on the Chemistry House Scheme to which the Prince of Wales gave his blessing at the Guildhall. The point that Professor Thorpe makes quite clear is that the original "Chemistry House" idea will be completely preserved within the present scheme, and that the claims on chemical people of means are not in the least weakened by necessary co-operation with other societies in the provision of a central building. There will, he points out, be a vertical chemical section throughout the seven floors of the building, which will have its own separate entrance and will be divided on each floor, excepting on the library and top floors, from the remainder of the building by swing doors. The section will contain its own small lecture room and office facilities for each society; it will therefore constitute a definite and distinct "Chemistry House," and will be so named. Professor Thorpe has played such a splendid part in bringing this scheme into its present practical shape and has stated so clearly the general advantages of it, that it is almost unnecessary to add our sincere desire that he may have all the support possible from every quarter.

Chemical Plant Exhibitions

CONSIDERING that most of the speakers were agreed on the main point at issue—that chemical plant exhibitions *were* of use—there was a surprising amount of vigour in the debate that followed the annual dinner of the British Chemical Plant Manufacturers' Association. Naturally the German Achema Exhibition figured prominently in the various speeches, and the chairman, Dr. H. J. Bush, stated at the outset that the intention was to develop the proposed exhibition until it could bear comparison with its German rival. Later speakers went farther and urged that it was possible, in fact necessary, to excel Achema.

Much of the success of the debate was, no doubt, due to the "intentionally provocative" opening speech of Mr. H. A. Humphrey, consulting engineer of Imperial Chemical Industries, some of whose arguments were well qualified to draw forth all the admirable fighting qualities and patriotism of Mr. J. Arthur Reavell who followed him. The value of a chemical plant exhibition, said Mr. Humphrey, depended on the novelties displayed and a proper emphasis on departures in constructional practice or improvements in design. He heartily endorsed the methods of the Achema 1930 promoters in preparing a report on the exhibition dealing solely with "exhibits which appeared to possess novelty or special interest" and entirely ignored those in which there had been no advance. Deprecating the desire of many manufacturers to keep their ideas secret, he instanced the American manufacturer, who had no hesitation in revealing his methods to English competitors, and relied on his firm's ability to keep always ahead of them. That this was a general practice Mr. Reavell flatly denied from his own experience. "They show the visitor how to pack their goods, and how to make steam, but the visitor sees as much of the processes in those works as he would see in the works of I.C.I." he added amidst laughter.

In an attempt to survey the question from the manufacturers' side Mr. Humphrey alluded to the costs factor, which was met with in every direction. The far-sighted policy of I.C.I. directors had led them to order British plant, whereas if large orders had been placed abroad they would have shown a paper advantage of many thousand pounds. This was done, he said, because it was recognised that these orders would have enabled foreign manufacturers to move ahead of our manufacturers. Prices and therefore costs had got to come down, and the method he suggested was standardising brought about by rationalisation—combining interests and concentrating manufacture.

British manufacturers, declared Mr. Reavell, if given the same chance as foreign, could evolve plant to meet all our requirements, but owing to our expensive social services and our different level of wages and hours, the price would probably be higher than that of foreign plant. Standardisation he described as a craze, in which the chemist was the worst sinner. Standardisation and efficiency, owing to the need for meeting specialised requirements, could not run together in regard to chemical plant. The rationalisation question was dealt with by Dr. W. H. Hatfield, who urged that if we must rationalise we should not carry that process to its logical conclusion, but leave sufficient competition to ensure efficiency.

Mr. Reavell and Dr. E. F. Armstrong joined in an attack on "worship" of German products. Mr. Reavell was able to furnish some concrete examples of the superiority of English plant, in particular of a £275,000 plant which had but one German component, costing £25,000, and when it was started up the only part that failed was the German part. Another instance was of an order for a spray-drying plant, obtained by Mr. Reavell's firm from Berlin, and followed within three months by a repeat order for a plant twice as large. Dr. Armstrong argued that we had broken down the German fetish on the academic and manufacturing sides of chemistry itself, and we had now to break it down with regard to chemical plant. We should have an exhibition of chemical plant next year, and an extraordinarily good one, if only for the purpose of showing that Achema was not the last word. An important side issue raised by Dr. Armstrong, in which he was supported by Dr. Hatfield, was the necessity for co-operation between plant manufacturers and the various metallurgical institutions in an attack on certain major common problems, such as that of corrosion.

An interesting contribution at the close of the debate came from Mr. Clarke Taylor, Secretary of the British Industries Fairs, who spoke rather from the angle of the science of exhibiting than the exhibiting of science. He alluded to the exceptional difficulties which faced an exhibitor of chemical plant or of chemicals, and of the importance of displaying what an article could do as much as the article itself. As a general principle to be borne in mind for adding to the interest of an exhibition it has much to commend it, more especially at a general exhibition such as the British Industries Fair.

Books Received

VEROFFENTLICHUNGEN DES WISSENSCHAFTLICHEN ZENTRAL—LABORATORIUMS DER PHOTOGRAPHISCHEN ABTEILUNG—AGFA. Leipzig: S. Hirzel. Pp. 156. 10 R.M.

DECHEMA MONOGRAPHIEN. Nr. 12. Vol. 2. By Dr. Ing. Emil Kirschbaum. Berlin: Verlag Chemie, G.m.b.H. Pp. 40. M.5.

ELECTROLYTIC CONDUCTION. By. F. H. Newman. London: Chapman and Hall, Ltd. Pp. 442. 25s.

THE SOUTH AMERICAN HANDBOOK, 1931. London: Trade and Travel Publications, Ltd. Pp. 740. 2s. 6d.

EXERCISES IN GENERAL CHEMISTRY AND QUALITATIVE ANALYSIS. By Horace G. Fleming and Saul B. Arenson. London: Chapman and Hall, Ltd. Pp. 298. 0s.

AN INTRODUCTION TO CHEMISTRY. By John Arrend Timm. London: McGraw-Hill Publishing Co., Ltd. Pp. 560. 17s. 6d.

LABORATORY EXERCISES IN GENERAL CHEMISTRY. By John A. Timm and Orion E. Schupp. London: McGraw-Hill Publishing Co., Ltd. Pp. 140. 6s. 3d.

FUNDAMENTALS OF ORGANIC CHEMISTRY. By Harry F. Lewis. London: McGraw-Hill Publishing Co., Ltd. Pp. 390. 13s. 9d.

The Calendar

Dec.		
8	Ceramic Society: "How Far Can We Trust Pyrometers?" Dr. H. Moore. 7.30 p.m.	North Staffordshire Technical College, Stoke-on-Trent.
8	Society of Chemical Industry (Yorkshire Section): "Antioxidants." W. J. S. Naunton.	Gt. Northern Hotel, Leeds.
9	Society of Dyers and Colourists (Huddersfield Section): "An Evening with the Electrons." Dr. H. H. Dodgson.	Huddersfield.
9	Institution of Petroleum Technologists. 5.30 p.m.	House of the Royal Society of Arts, John Street, Adelphi, London.
9	Institute of Metals (N.E. Coast Section): "Properties of Coke." Professor H. V. A. Briscoe. 7.30 p.m.	Armstrong College, Newcastle-on-Tyne
9	Institute of Chemistry and Society of Chemical Industry (Edinburgh Sections): "Chemical Problems in Mining." Professor H. Briggs. 7.30 p.m.	Mining Laboratories, 79, Grassmarket, Edinburgh.
9	Institute of Metals (Swansea Section): Lecture and Demonstration on Copper Welding. W. Andrews and H. Martin. 6.15 p.m.	University College, Swansea.
9	Society of Chemical Industry (Glasgow Section): Ramsay Chemical Dinner.	Glasgow.
10	Electroplaters' and Depositors' Technical Society. Joint meeting with the Faraday Society. Papers by D. J. MacNaughtan, A. F. Hammond, A. W. Hothersall, S. Glasstone, J. B. Speakman, W. J. Shutt and J. Stirrup. 8.15 p.m.	Northampton Polytechnic Institute, London.
10	Institute of Fuel: "High Powered Gas and Diesel Engines for Electrical Generation." Maximilian Gercke. 6 p.m.	Burlington House, Piccadilly, London.
11	Society of Dyers and Colourists (West Riding Section): "Photo-synthesis of Sugars and the Chemistry of Life." Professor E. C. C. Baly.	Bradford.
11	Chemical Engineering Group: Joint meeting with the Bristol Section of the Society of Chemical Industry. "Modern Water Treatment." S. Stevens. 7.30 p.m.	University, Birmingham.
11	Optical Society: Ordinary meeting. 7.30 p.m.	Imperial College of Science and Technology, London.
11	Oil and Colour Chemists' Association: "The Colorimetry of Pigments." Dr. G. F. New, G. S. Disney and D. L. Tilleard. 7.30 p.m.	London.
11	Institute of Metals (Birmingham Section): "Plating." E. J. Dobbs. 7 p.m.	Chamber of Commerce, New Street, Birmingham.
11	Institute of Metals (London Section): "Magnesium Alloy Castings." E. Player. 8 p.m.	Edibell S.F. Apparatus, Ltd., 89–91, Wardour Street, London.
12	Society of Dyers and Colourists (Manchester Section): Short Papers by Members. 7 p.m.	36, George Street, Manchester.
12	Institute of Chemistry (South Wales Section): "The Structure of Molecules." Dr. P. M. Davidson. 7.30 p.m.	Thomas's Café, High Street, Swansea.
12	Oil and Colour Chemists' Association: "The Incorporation of Dry Pigments into the Medium." A. W. C. Harrison. 7 p.m.	Royal Institution, Liverpool
12	West Cumberland Society of Chemists and Engineers: "Lightning Conductors, Steeplejacks and their Work." G. A. Collier. 7 p.m.	Workington.
12	Institute of Metals (Sheffield Section): "Studies in the Electrodeposition of Silver." R. H. D. Barklie and A. E. Nicol. 7.30 p.m.	University, Sheffield.
12	Institute of Fuel: "Some Factors Influencing the Design of a Combustion Chamber for Pulverised Fuel." T. F. Hurley. 7.30 p.m.	Technical College, Green Lane, Derby

The Value of Chemical Plant Exhibitions

Discussion by Leading Users and Makers

The question of utility of chemical plant exhibitions was thrashed out by expert opinion at a discussion which followed the annual dinner of the British Chemical Plant Manufacturers' Association. The speakers included representatives of prominent users and manufacturers, and besides the main subject, a number of closely allied topics arising from it were keenly discussed.

THE Annual Dinner of the British Chemical Plant Manufacturers' Association was held at Maison Jules, Jermyn Street, London, on Thursday, November 27. The Chairman (Dr. H. J. Bush) received the members and guests, and presided at the dinner. The members and visitors present included: Mr. E. A. Alliott, Dr. E. Frankland Armstrong (Association of British Chemical Manufacturers), Colonel E. Briggs (Lever Brothers, Ltd.), Mr. M. D. Curwen, Dr. J. Varcos Eyre, Professor W. E. Gibbs, Mr. George Gray (Chairman, Chemical Engineering Group, Society of Chemical Industry), Mr. F. A. Greene, Professor J. W. Hinchley (Hon. Secretary, Institution of Chemical Engineers), Mr. H. A. Humphrey (Imperial Chemical Industries, Ltd.), Dr. R. Lessing, Dr. H. Levinstein, Mr. L. St. L. Pendred (President, Institution of Mechanical Engineers), Mr. H. J. Pooley (Secretary, Society of Chemical Industry), Mr. J. Arthur Reavell (Kestner Evaporator and Engineering Co., Ltd., and President of the Institution of Chemical Engineers), Dr. R. Seligman (Aluminium Plant and Vessel Co., Ltd., and President of the Institute of Metals), Mr. H. Talbot, and Mr. J. W. Wilson.

Following the dinner the gathering debated the question "Are Chemical Plant Exhibitions of any Use?"

The Fiftieth Anniversary

The Chairman, on behalf of the Association, expressed a hearty welcome to the distinguished representatives of the chemical industry, of the universities, of the engineering profession, and of the technical Press who were present. Discussing the circumstances leading to the proposal to hold a chemical plant exhibition in 1931, he said that in that year the Society of Chemical Industry would celebrate its fiftieth anniversary. At a meeting of the Committee of the British Chemical Plant Manufacturers' Association it had been suggested that the Association should hold an exhibition, and a proposal was put forward that it might collaborate with the Chemical Engineering Group of the Society of Chemical Industry—which was considering a similar display—and with the research departments of some of the great firms and the Department of Scientific and Industrial Research. The proposal was not assented to unanimously by the Association's members, though there was a strict majority in favour of it, and steps were being taken to put the preliminary work in hand. Space had been secured at the Central Hall, Westminster, and it was hoped to have a very good show. The Committee had felt it opportune that the question as to whether chemical plant exhibitions were worth while should be discussed on the occasion of the annual dinner, and looked forward to hearing the views of members and friends on the subject. Whatever the verdict of the meeting might be, he felt sure the discussion would assist those who were still undecided as to whether they should come in or not. No doubt many present had seen the German Achema Exhibition last year; the intention of the Association, provided it had the backing of its members and friends, was to develop its exhibition until it could show something which would bear comparison with the German Achema Exhibition. The question was whether it was worth while, and if so, could it be done?

Mr. H. A. Humphrey

Mr. H. A. Humphrey (Consulting Engineer, Imperial Chemical Industries, Ltd.) opening the discussion, said that the value of a chemical plant exhibition depended on the progress and development displayed. The mere collection of plant, in order to remind certain customers of the existence of certain manufacturing companies, was expensive and largely a waste of time. Could not a leaf be taken out of the book of the best experts at display in shop windows, who used labels, tapes and arrows to guide the eye to new points grafted on to known apparatus, even if it was only to indicate that a riveted joint was now replaced by a welded joint, or that a new material in construction had been adopted in order to lessen wear or corrosion?

It was a weary job going round an exhibition to find out what was new if no assistance in this direction was available, and as a start he thought those responsible for the shows would be justified in restricting the use of a distinctive colour of label to exhibits of new things. The idea could be carried further in the issue of catalogues, by printing in a different colour those items which were exhibited for the first time, and in yet another colour those items which, in the opinion of the exhibition executive, showed real novelty or progress. He had at his office a report prepared for his firm and which dealt with the Achema Exhibition of 1930, held at Frankfurt. In the introduction it was stated that "This Report consists of notes on exhibits which appeared to possess novelty or special interest." From beginning to end, there was not a word about the mass of ordinary exhibits in which no advance had been registered, and so, as far as the information conveyed to his company was concerned, the exhibition might have been confined to the list of items reported upon. As this report was regarded as satisfactory, and was circulated to all concerned inside the confines of Imperial Chemical Industries, it was clear that at least one firm took absolutely no notice of the bulk of the plant exhibited. Of course, his company wanted catalogues of plant for the daily use of the purchasing department, but so far as they were concerned, exhibitions would be greatly enhanced in value if a larger proportion of the exhibits were deleted until every stand became a centre of attraction, because some additional advance could be seen.

Some people would naturally ask, "Why should we display all our new ideas for our competitors to copy? There are many things which cannot be covered by patents, and we have spent much money on such developments. We cannot afford to give them away," but he assured them that those firms who kept ahead and got the business were precisely those who had no fear on such matters. Everyone knew the tale of the American manufacturer who showed some English competitors round his works, and when asked why he was so generous, replied that he would like nothing better than that they should copy his plant, because then he was certain that he would always be ahead of them and their plant would be out of date by the time it was built. That, at any rate, was the spirit of progress, and it was becoming increasingly clear that the opposite view was dying out. His company sent missionaries all over the industrial world wherever new and important things might be inspected, and they would not do it unless information was readily and fully forthcoming.

Do Plant Exhibitions Pay?

From the chemical plant manufacturers' side he thought the exhibition question could be put more pointedly in these terms. Did chemical plant exhibitions pay? The answer could only be discovered by a careful analysis of the order books, and in some cases at least, the answer would be in the negative. One could not touch this question without coming up against costs in every direction, so they must face the matter boldly and come to grips with it. Although on a previous occasion similar to this, Colonel Pollitt had been able to tell them that at least 98 per cent. of the total plant requirements of Imperial Chemical Industries had been ordered in Great Britain, yet had cost alone been the criterion, a quite different tale would have to be told. The fact was that foreign chemical plant was frequently much cheaper even when, in quality and design, it was fully up to the British standard. Only a far-sighted policy of the I.C.I. directors, who recognised that if large orders were placed abroad it would help foreign manufacturers to move ahead of our manufacturers, had restrained them from placing orders which showed a paper advantage of very many thousands of pounds. But that course of action had been taken in the hope that our home manufacturers would earnestly strive to bring their prices into line with foreign competition for similar class goods, and so justify this policy.

What then were the manufacturers doing in this direction? That again was a question that they only could answer, but he could say something about what the German industrialists

were doing. He attended the World Power Conference, held in Berlin this year, and never before had he found the Germans so frank and open in discussions of industrial matters. He visited a good many works typical of their important industries, and asked many questions, to which replies were given without reserve. The most important conclusion at which he arrived was that in such industries the concentrated efforts had resulted in reducing the man hours for a given product to no less than one half in the last six years. Prices and therefore costs must be brought down, and how that was to be done in the face of our present fiscal system and tremendous burden of taxation was enough to worry industrialists to an extent that demanded his sincere sympathy. He did not believe that standardisation, as such, would assist very much. The only kind of standardisation that would really help was that which was brought about by rationalisation. Here at least was one way by which they could help themselves, by combining interests, concentrating manufacture, and standardising plant.

When speaking in 1928 of makers of chemical plant, Colonel Pollitt said: "We may safely assume that there are in this country 100 such manufacturers. The effects of this obvious duplication are either that overhead charges are making the products unduly expensive, or else that less attention is given to the design, research work, etc., than the fabrication of chemical plant deserves." Mr. Humphrey did not apologise for recalling that statement because they were gathered there for mutual help, and in his opinion rationalisation would help forward every favourable factor which he had dealt with in this short and intentionally provocative speech.

Mr. J. A. Reavell

Mr. J. Arthur Reavell (Kestner Evaporator and Engineering Co., Ltd.) in a defence of British engineers and of British chemical plant, first commented upon Mr. Humphrey's reference to American manufacturers and American works. He said he had visited lots of American works, and the suggestion that the Americans showed the visitor everything in their works was all nonsense. They did nothing of the kind; they showed the visitor how to pack their goods and how to make steam, but the visitor saw as much of the processes in those works as he would see in the works of I.C.I. or the Lieber Company (laughter). Again, the remarks made with regard to the Germans were not 100 per cent. correct. He, with a man who had one of the best brains in this country, had been interested in a certain plant which was to go to Germany. Its cost was £275,000 when they were introduced to it. Before they had finished with it, everything in it was British except one part, the value of which was £25,000; the latter part was German, and when the whole plant was started up the only part that had failed was the German part of it. Let us get down to hard tacks, therefore, and learn the truth about this German worship. Students of chemistry were brought up to think that the only reagent that was of any use for making a test was a German reagent. That was rot. Anything one wanted could be obtained from British sources, and it was just as reliable as anything that could be obtained anywhere else in the world, Germany and America included. Again, the Germans did not get all the business. In this connection he recalled an occasion on which his firm had been approached in respect of one of his patents for spray drying. The approach was made by representatives of a German firm, who had wanted a plant for spray drying a certain product. They had tested the plant three times at one of his firm's experimental works, and had pronounced it to be perfect. Consequently, the firm had received an order for the installation, which was to be fitted up in Berlin, and within three months from the time of its operation the firm had received a repeat order for a plant twice as large. That was because the firm had given them what they had wanted, for they could not get it in their own country.

Mr. Reavell assured British manufacturers that, if they placed British chemical plant manufacturers on the same level as the foreigners, English brains would evolve English plant which would meet the requirements, and it would be just as good as the foreign. English prices, however, would probably be higher. The prices would be higher than those of foreign competitors because social services in this country were so expensive, our level of wages and hours of working were different from those applying in other countries. He asked the great combines—whom he respected, and whose difficulties he appreciated—to help the British manufacturers of chemical plant to meet their difficulties; it was not unfair to ask that.

Coming to the question as to whether chemical plant exhibitions were of any use, he said that if he were a manufacturer making the same products all the while, and improving them as time went on, he would go into every exhibition he had the chance to go into. He had made very careful inquiries, and he believed he was right in saying that the German manufacturers who had shown special plant at the recent exhibition had been helped by their Government; if they were unable to sell the plant at the proper price they received a contribution which would enable them to sell it at a price which would suit the purchaser and yet avoid loss. Could we get our Government to do that? How were we to meet such competition, and was it fair competition? We could not exhibit plant at an exhibition under those conditions. Of course, British manufacturers could exhibit large drawings and photographs of some plants, but, on the other hand, many customers ordered plant on the condition that the manufacturers would not show anybody else what it was; some of the best work was done under those conditions. Only a few weeks ago he had been asked if he could produce a plant to do certain work. As a matter of fact, his firm had produced a plant previously to do the same work, and possessed drawings showing all the details of the installation, but could not show them to the inquirer because the plant had been made for one of his competitors. It would not have been right to have shown it to him, and they would not do so.

Then there was the question of standardisation. What a craze that was! And the chemist was the worst sinner. The chemist asked to be allowed to see one's standard plant for evaporating or distilling a certain liquor; then he stated his requirements, and it became clear that there was no plant other than a special one that would meet those requirements. How could one standardise under those conditions? Standardisation and efficiency did not run together in regard to chemical plant; standardisation was all right for things like bolts and nuts, valves and flanges, for they could be standardised easily.

Col. E. Briggs

Col. E. Briggs said that the question as to whether or not chemical plant exhibitions were of any use would find divergences of opinion. If, however, the question had been "Could chemical plant exhibitions be made of use?" they would be able to answer the question in the affirmative. There were heaps of precedents for exhibitions, and a lesson that had been learned from all exhibitions was that they must be organised on a sufficiently large scale. Again, it was necessary to get the right sort of publicity for the exhibition. It was of no use appealing to the public generally. It was necessary to get at the people who mattered, and the relationship between the Chemical Plant Manufacturers Association and the Association of British Chemical Manufacturers ought to be very helpful indeed in that particular, for the latter organisation did in the main represent the chemical manufacturers, or the people who were interested in chemical plant in this country. It had been suggested by Mr. Humphrey that the new or novel plant was perhaps the only kind that was likely to interest prospective buyers to-day, but he himself did not think that was the case entirely. There were a great many who did not know really what they wanted (hear, hear), and, therefore, a general exhibition of chemical plant might give them just the clue as to the type of plant they wanted. That was the justification for a general exhibition of plant. Col. Briggs also emphasised that there should be in charge of the various exhibits people who could give a really intelligent explanation of them.

Dr. R. Seligman

Dr. R. Seligman (Aluminium Plant and Vessel Co., Ltd.) said he was a firm advocate of holding exhibitions in order to enable manufacturers of plant to show their wares. He recalled an exhibition organised some twenty years ago at the Royal Agricultural Hall by Mr. Bridges. From Mr. Bridges's point of view the exhibition must have been a most hopeless failure; there could not have been more than ten exhibitors, and there were not more than 50 purchasers. The Aluminium Plant and Vessel Co. had exhibited there, and he definitely dated the company's entry into the chemical trade from that

exhibition. One aspect of the problem of exhibitions which so far had been overlooked by those taking part in the discussion was the advantage which the exhibitor gained by contact with clients or prospective clients. The Aluminium Plant and Vessel Co. were confirmed exhibitors, and exhibited at every exhibition in connection with the trades with which they were connected, and the principals never considered it as being beneath their dignity to attend those exhibitions personally for a great part of the time.

Mr. M. D. Curwen

Mr. M. D. Curwen said he had visited the German Achema Exhibition, and what he had seen there had opened his eyes very much indeed to the possibilities of chemical exhibitions. These should be big rather than confined to a small circle of exhibitors. They should include not only chemical plant but all plant made by chemical engineers, not only for the chemical industry, but for the very many allied industries which utilised chemistry and physics. He urged also that if possible the exhibition should be open to foreign manufacturers, because British plant would predominate and it was well to show that we had nothing to fear from foreign competitors. Further, it should be repeated at reasonably close and regular intervals.

Dr. E. F. Armstrong

Dr. E. F. Armstrong (Association of British Chemical Manufacturers), referring first to the impending lapse of the Dyestuffs Act, said he supposed all had heard that there were to be no more British dyes. Mr. Snowden did not want them; he would rather have them imported. Apparently it did not matter very much if there were no more British dyes; we could get them from Germany. Dr. Armstrong urged, however, that it did matter to plant manufacturers, because if there were to be no more British dyes, those who had been making those dyes would not want any more plant. It was not merely a question of displacing half a dozen unfortunate dye makers and a couple of chemists, but also of throwing British engineers and chemical plant manufacturers out of work. The question as to whether or not we were to have a chemical industry had long been answered in the affirmative, and we had made tremendous strides towards the goal during the last few years. Surely we should also get our chemical plant in this country! The only way to ensure getting it was to work together. There had been a horrible fetish that everything good relating to chemistry and chemical plant came from Germany. We had broken down the fetish in regard to chemistry itself, on the academic side and the manufacturing side, and we must break it down wish regard to plant. It was true that new plant was required for special purposes, but we did not want too much new plant. Let the chemical manufacturers and the plant manufacturers work together to produce absolutely first-class standard plant for the bread-and-butter trade; for, after all, the biggest proportion of the production was the bread-and-butter trade. Co-operation could also be applied with advantage to the evolution of special plants. The production of many new things presented very special problems, such as the problem of corrosion, and Dr. Armstrong urged that we should be more prepared to pool information and to help to solve such problems mutually. There should be an exhibition of chemical plant next year, and it should be an extraordinarily good one, if only for the purpose of showing up the Achema. We must not allow it to be thought that Achema was the last word. He suggested that, in addition to the exhibits of individual firms on the individual stands, there should be some effort to show what was being done, on co-operative lines, to solve special problems, such as the problem of corrosion. In chemical industry to-day America was further ahead of the rest of the world than Germany had been even when at her best. There were two reasons for that. The first was that America gave her young men a chance, and the second was that she poured out money without stint on anything that was new. We might not be able to imitate America in those respects, but by observing and learning, and by blending British conservatism with American foresight and optimism, we could make considerable progress.

Dr. W. H. Hatfield

Dr. W. H. Hatfield (Brown-Firth Laboratories, Sheffield) agreed with Dr. Armstrong that everything was to be gained, by a most intensive study of the problems of corrosion, and in this connection he said that industry owed very much to Professor J. W. Hinchley. Discussing rationalisation, Dr. Hatfield said that over-rationalisation and over-standardisation would stabilise our civilisation as it is to-day. If we must rationalise, he urged, do not let us carry it to its logical conclusion, but let there be sufficient competition to ensure that everyone was stretched to the utmost as regards efficiency. He was heartily in favour of the policy of holding a chemical plant exhibition in 1931. Dr. Hatfield took the opportunity to pay a tribute to Imperial Chemical Industries, Ltd., for having placed orders in this country involving great sums of money. In the end he believed they would gain as the result of their broad-minded policy.

Major F. W. Bain said that if he had spoken prior to Dr. Hatfield on the question as to whether or not an exhibition of chemical plant was of any use, he would have answered emphatically "No." He associated himself with Dr. Hatfield, however, in urging that an exhibition should constitute a challenge to the world.

Mr. Clarke Taylor

Mr. Clarke Taylor (Secretary, British Industries Fair) said it seemed to him that chemical plant manufacturers had a most difficult job in deciding upon their exhibits. They had to think not only of the exhibit itself, but of what it would do, and he was inclined to advise that one should show the results rather than the article itself. They must do that if they were going to make a show which would challenge the world, and which buyers from other countries would recognise as providing a complete answer to the question as to what this country could do. The Department of Overseas Trade, which was interested in all displays in this country which might bring in the foreign buyer, would be glad to render any assistance it could.

"Chemistry House": Professor Thorpe's Appeal for Support

To the Editor of THE CHEMICAL AGE.

SIR,—At a time when it is imperative that all chemists should join and subscribe, in accordance with their means, towards the cost of providing new premises to house their respective societies, the article in your issue of November 29, entitled "Under one Roof," based as it is on a misapprehension, may cause real harm. The idea of a Central Chemical House has never been abandoned, and it is wrong to suggest that the interests of chemists and chemistry are likely to be swamped by the use of "all sorts of scientific and technical societies" which the writer of your article imagines are to be housed together by the new Association.

If you will refer to your issue of March 29 last you will notice that in my Presidential Address to the Chemical Society, I state that two-fifths of the proposed building is to be set aside for the accommodation of the Chemical Society, the Society of Chemical Industry, the Institution of Chemical Engineers and the Institution of the Rubber Industry. This will be a vertical section throughout the seven floors of the building which will have its own separate entrance and will be divided on each floor, excepting on the Library and top floors, from the remainder of the building by swing doors. The section will contain its own small lecture room and office facilities for each Society. It will constitute therefore a definite and distinct "Chemistry House," and will be so named.

—Yours faithfully,

December 1. JOCELYN THORPE.

[We gladly give publicity to this letter, which is also referred to in our leader columns.—ED., *C.A.*]

J. M. Newton Vitreo-Colloid (1928), Ltd.

IN the Companies Court on Monday Mr. Justice Maugham made an order for the compulsory liquidation of J. M. Newton Vitreo-Colloid (1928), Ltd., on the petition of the Widnes Foundry (1925), Ltd., of Widnes.

Mr. Radcliffe, for the petitioners, said they had two large engineering contracts with the respondent company under which they had already supplied machinery to the value of £37,000, and there was still owing to them nearly £13,000. Mr. Reed, for the company, said he could not resist the order.

The Dyestuffs Act Controversy

Chemistry Professors Protest Against Government Decision

The controversy over the decision of the Government to allow the Dyestuffs (Import Regulation) Act to lapse continues to rage with considerable vigour, and one of the events of the week has been a joint protest against the decision by 15 professors of chemistry in British universities. We go to press on the eve of an important debate in the House of Commons on the fate of the Act.

THE following is the text of the joint letter of protest to the Prime Minister against the decision of the Government to allow the Dyestuffs Act to lapse next January, signed by fifteen professors of chemistry in British universities :—

" The dyestuffs industry has grown out of the pure science of organic chemistry ; in fact, it was the first industrial result of the development of organic chemistry into a systematic science. It was natural, therefore, that when this early success led to the manufacture of other synthetic organic products on the large scale, these newer industries should develop from the technique and experience acquired in the manufacture of dyestuffs.

" In discussing the dyestuffs industry of to-day, it is advisable, therefore, to remember that the phrase implies a major portion of the whole organic chemical industry, and in no other branch of industry has there been such a clear repercussion between the art of the manufacturer and the science of the schools.

" It is a truism nowadays to state that the growth of organic chemistry and organic chemical industry have gone hand in hand. The discovery of the scientist in the laboratory to-day is the industrial process of to-morrow. This progress is reflected back to the universities, the fountains of pure science, in a number of different ways, so that the two have become mutually dependent to such an extent that any blow aimed at the industry is bound to have an effect on the teaching and pioneering research work carried out by the universities. An example of this is seen in the large number of chemists and technologists carried by the world's most successful dyestuff making concerns. These men come from the universities where they are trained, not only in science, but also in the methods of scientific research, a high standard of attainment in these directions being required by the conditions of the modern organic chemical industry. It is no exaggeration to claim that the existence of flourishing schools of organic research in the universities is dependent on the demands made by the industry for the services of their students. The beneficial effect of the activities of such schools on other industries than those which primarily brought them into being is also a matter of public interest. It is not too much to say to-day that the salvation of many great industries of national importance depends on the application of scientific methods. The best training school for the future technologists and administrators of many of these industries is the organic chemical laboratory. Anything which tends to check the growth of the schools of organic chemistry is, therefore, a blow at the future of a great many industries besides those most obviously or immediately concerned.

" It is with these considerations in mind that we call attention to the great harm that may be done if any steps are taken which have the effect of a setback to the dyestuffs industry which is being developed in this country at such cost and after so much effort, not only by those immediately concerned but by the teachers and research workers of the schools and universities.

" We would, therefore, plead for a reconsideration by the Government of their decision to allow the Dyestuffs Act to lapse, so as to ensure conditions which allow the continued development of the dyestuff and organic chemical industry in this country."

The signatories are :—

Professor G. Barger, Professor of Chemistry in relation to Medicine, University of Edinburgh.

Professor T. C. Campbell, Professor of Chemistry, University of Aberystwyth.

Professor F. Challenger, Leeds.

Professor W. N. Haworth, Professor of Chemistry in the University of Birmingham.

Professor I. M. Heilbron, Heath Harrison Professor Organic Chemistry, University of Liverpool.

Professor G. G. Henderson, Regius Professor of Chemistry, University of Glasgow.

Professor C. K. Ingold, Professor, University College, London.

Professor J. Kenner, Professor of Technological Chemistry, University of Manchester.

Professor A. Lapworth, Sir Samuel Hall Professor of Chemistry, University of Manchester.

Professor Sir William Pope, Professor of Chemistry, University of Cambridge.

Professor J. Read, Professor of Chemistry, Director of the Chemistry Research Laboratory, University of St. Andrews.

Professor R. Robinson, Professor of Organic Chemistry, University of Oxford.

Professor J. L. Simonsen, Professor, University of Bangor.

Professor J. F. Thorpe, Professor of Organic Chemistry, Imperial College of Science and Technology.

Professor W. P. Wynne, Professor of Chemistry and Dean of the Faculty of Pure Science, University of Sheffield.

Sir David Milne-Watson

An important estimate of the dyestuffs industry as " the key to our future industrial prosperity," is given by Sir David Milne-Watson in a letter to *The Times* on Thursday.

" The Dyestuffs Act," he says, " has given a remarkable and well-needed stimulus to the study of organic chemistry in this country, with the result that we have now attained a position in no way inferior to that of Germany and the United States as regards facilities for instruction and research. Of the quality of the original scientific work done in this country there has never been any doubt, but it is only now that the supply of properly trained chemists and chemical engineers is becoming adequate for the full requirements of our industries.

" The dyestuffs industry provides an outlet which attracts the better type of man to organic chemistry. The training and experience of these men will further be available not only for other branches of the steadily expanding chemical industry, but also for industrial activities outside the purely chemical field, which can only progress in so far as they make proper use of the services of these chemists and chemical engineers. Anything which will impede the development of our dye industry will thus have a correspondingly serious effect on our industrial life as a whole.

" The unfortunate situation of the coal industry is just now in everyone's mind, and I would like to refer briefly to it as an example of what I have said. The raw materials of the dye industry are derived mainly from coal tar, and as a result of the development of that industry what was originally an unpleasant material of no commercial utility has become a source of remarkable wealth which has naturally enhanced the value of its parent material—coal. We have not yet utilised these resources to the full. Furthermore, the highly complicated investigations necessary to achieve the commercial production of motor spirit and liquid fuels from coal can only be carried to a successful conclusion by the activities of a team of trained chemists and chemical engineers. If, as the result of the restriction of our dyestuffs industry, we are unable to provide suitable men in adequate numbers, we may fail to solve a problem which gives great promise of opening up a new era of prosperity for our coal industry."

Mr. G. C. Railton and Mr. James Morton

A retort to Mr. James Morton's appeal to the Government to reconsider their decision appeared in *The Times* on Monday from Mr. G. C. Railton, a director of the Calico Printers' Association, Ltd. Mr. Morton's interests as a user, he states, " entitle him to express an opinion as to the benefit of repealing or continuing the present Act, but as it is generally understood that the productions of his dyeing factories are of the higher class speciality type, little used for the clothing of the millions

in India, China and Africa, it would be instructive to know what relation his dyed productions bear to the total great export trade upon which Lancashire depends for her existence. I venture to ask if it amounts to 1 per cent.

"The following Board of Trade export figures are illuminating, and show clearly how the coloured textile trade has suffered :—

In millions of linear yards.

Year.	Prints.	Dyes.	Coloured Wovens.	Total.
Total exports of coloured textiles 1913	1,263	1,151	290	2,704
Do. 1929	552	826	144	1,522
Do. (10 months) 1930	351	493	93	937

"It would be untrue to suggest that this disastrous loss of trade is solely or even mainly attributable to the operations of the Act, but dyestuffs constitute one of many items in the total cost of our productions, and, as we are faced with world competition at prices which present costs cannot meet, any form of restriction upon one of our most important raw materials greatly increases our difficulties. Dyemakers have suggested that they are willing to meet the 'world prices' of dyestuffs, but what is a 'world price' and how can it be fixed? Dyestuffs, unlike cotton or even heavy chemicals, have no standard market price, and the thousands of different qualities are sold on a basis varying according to circumstances. In the absence of competitive quotations, any claim to meet world prices is meaningless.

"Under the present Act the foreign supplier has to submit samples of all new dyes before a licence is granted, and it is well-known that British makers obtain these samples. Under these conditions, is this country or its foreign competitors likely to receive priority in obtaining the benefits of their research in the form of new productions? The importance of this aspect of the problem is very great. If Lancashire is to retain her place in the world's production of coloured textiles, she must have free and immediate access to all the latest developments of colour, whereas, under the present Act, the foreign maker must necessarily feel that his interests lie in other directions.

"Mr. Morton ignores these points, possibly because as both maker and user he is unacquainted with the vast mass-production type of trade where price is the ruling factor. This, and not the speciality trade, is the trade in which the Japanese and Continental competition has brought such disaster to Lancashire."

Mr. Morton's Reply

In a reply to Mr. Railton, published in the same newspaper on Wednesday, Mr. James Morton says :—"Mr. Railton's letter shows the big drop in yardage of printed and dyed cloth exports, indicating that the restriction on dyes was in some way responsible. But he ignores other striking figures which show that by far the greatest drop was in the grey and bleached cloth trade, which have no dyes whatever entering into their cost of production, while the exports of wholly dyed cloth, the section most dependent on dyes, shows the least decline, and is, in fact, the only section of the textile trade with an increase in value of turnover over pre-war days—the figures being £33,914,000 in 1929, against £26,569,000 in 1913. Such facts surely suggest that the trouble with Lancashire lies elsewhere than in the dye industry.

"I do not know whether I ought to feel penitent over Mr. Railton's remarks on my firm's not being one of those whose products 'clothe the millions of India, China, and Africa.' Perhaps I have felt that my grandfathers did enough of that work in the past to have relieved me of a service that Mr. Railton evidently still clings to with a kind of missionary zeal. But when one has seen those peoples during the past decades importing machinery for their own use, and able and anxious to cater for themselves in those simple services, one has felt it not unwise to leave them to do so and look for other and higher activities for our home workpeople and our plant. Hence the 'specialising trade' which Mr. Railton rather scoffs at. But I venture to suggest that it is perhaps just in this direction that he, and Lancashire in general, might find a more interesting and lucrative sphere for their activities, one which, as old Carlyle said 70 years ago, does not gyrate on the pivot of the infinitesimal fraction of a farthing, but which can use to the utmost the best brains of the scientist and the artist and be worthy of an educated people now at our command."

Linen Manufacturer's Tribute to British Dyes

The following statement on British dyes has been circulated by Mr. W. H. Webb, chairman of the "Old Bleach" Linen Co., Ltd., Randalstown, Northern Ireland :—

It is stated by the Government that the throwing open of the British market to foreign dyes is in the interest of dye users. As large users of the highest grade vat dyes, the "Old Bleach" Linen Co., Ltd., is strongly opposed to the import of foreign dyes again becoming free. When manufacturers like ourselves give a comprehensive and unconditional guarantee that coloured goods are absolutely fast and fadeless under any treatment, we naturally have to be extremely careful. Before a new dye is used in our dye-house it is subject to most drastic laboratory tests. We test dyes from every country, and British dyes prove the most reliable and best. This country has had previous experience of German commercial methods. To ruin British manufacturers dyes were offered at a very low price. It would be so again, but once the British dye industry was wiped out the prices would fly up. The British dye industry has since the war developed a very fine research organisation, which is making rapid progress. This organisation is costly, and only the system of protection for the dye industry has enabled it to be built up. The intended action of the Government will, by removing the protection, make it impossible to carry on this most important work. I protest against the Government's statement that their action is in the interest of dye users. The only result of this action will be to increase the unemployment which at the last election they pledged themselves to ease.

The Cost of Dyes

In the course of a letter to *The Times*, of Wednesday, Dr. Alfred Rée, of Manchester, states :—

"When Lord Moulton declared that some form of protection would be necessary if we were to establish in this country a dye industry to compete successfully with the Germans and Swiss, I declared publicly on more than one occasion that the five years he suggested would be quite inadequate because of the tremendous complexity of the industry, as well as for several other reasons. It seemed to me that if those entrusted with the task here were successful in meeting the situation adequately after the lapse of 20 years they would deserve to be most warmly congratulated on what they had achieved. . . . I have always tried to envisage the position of the dye users in their attitude towards the Dyestuffs Act. I have had many friends among them, and it has been a matter of great regret to me that the form of agitation on the part of many of these dye users should have led to statements which are not in keeping with actual facts. It should be recognized that even if the average cost of dyes were to be 25 per cent. over what the ruling prices are at the present time, the average cost of the dye in the finished dyed or printed textile material would not on an average represent an increase of more than a small fraction of 1 per cent. of the total average cost of those textile fabrics.

"Let me put it another way. The amount of the best and fastest black dye necessary to dye sufficient material for a man's suit is, roughly speaking, about half a pound, which would cost about 6d. Suppose the cost of the dye were 25 per cent. higher, this would add merely 1½d. to the suit's cost price. Can it really be contended by the dye user or the textile manufacturer that such an addition to the cost of the finished article would constitute a serious burden on the textile industries of this country? . . . It is deplorable that the Government should have taken the decision they have done without a very careful inquiry into the facts of the case. They have consulted a number of other industries, but they have failed to do so of the one more closely affected than any other."

Colour Users and Specialities

Mr. John H. Swallow, a director of Sackville and Swallow, Manchester, writes :—

"The burden of establishing the dye-making industry has fallen, to a great extent, on the users; and especially in the early days of the Act they were subjected to economic penalties, which undoubtedly resulted in loss of business. The fact that these penalties have been gradually diminished is by no

means the end of the story. It is unfortunately true that the business lost has not been recovered, and, in my opinion, a repetition of penalties, either in the present or any other form, would, in the present state of our industry, prove disastrous. Through the official channels of the Colour Users' Association, it has been indicated that interference with our free access to all sources of supply is a matter that presents serious danger to our industry; and from the nature of our requirements we are, perhaps more than any other colour-using industry, dependent on specialities for the production of novel effects. While I do not desire to appear in any way antagonistic, it can definitely be said that British makers have shown no real disposition even to attempt the manufacture of many colours essential to our business. It may convey more to the reader when I state that, although upwards of 80 per cent. by weight of the requirements of the trade in which I am interested are purchased from British sources, we are compelled to import a greater number of products than we buy in this country. It will be realised, therefore, that the imported colours are specialities, used in relatively small quantities.

"Under existing conditions the possibility of any restrictions on the purchase of our raw materials cannot be contemplated, as we are faced with the absolute necessity of cutting down costs of production to the limit in order to have any chance in meeting world competition. It cannot, in fairness, be expected that the drastic step of reducing wages and staff will be taken whilst, at the same time, countenancing the continuance of such restrictive measures as the Dyestuffs Act. It is my firm conviction that all such artificial penalties must be eliminated. My company will continue to afford every assistance and encouragement to British makers, irrespective of legislation, and in my opinion the disappearance of the Dyestuffs Act and the removal of this controversy will be beneficial to both makers and users."

The Perkin Medal, 1931

Awarded to Dr. Arthur D. Little

THE American Section of the Society of Chemical Industry has awarded the Perkin Medal for 1931 to Dr. Arthur D. Little, chemical engineer and president of Arthur D. Little, Inc., Cambridge, Mass. Dr. Little, who is 66, was born in Boston and graduated from the Massachusetts Institute of Technology. He is a member of several scientific societies and a Fellow of the American Academy of Arts and Sciences. He is also a former President of the Society of Chemical Industry of Great Britain, the American Institute of Chemical Engineers and the American Chemical Society. His achievements include important work in the fields of artificial silk and petroleum, and he was chemical engineer and superintendent of the first mill in the United States to manufacture sulphate wood pulp. The medal will be presented at a joint scientific meeting on January 9 next.

The 1930 holder of the medal was Dr. Herbert H. Dow, founder and president of the well-known Dow Chemical Co., whose death occurred on October 15.

The Royal Institution

AT a general meeting of the members of the Royal Institution, held on Monday afternoon, Sir Robert Robertson, Treasurer and Vice-President, in the chair, Lord Eustace Percy was unanimously elected President in succession to the late Duke of Northumberland. The thanks of the members were returned to Major C. E. S. Phillips, Secretary, for his gift of a water-colour of the Royal Institution by T. Hosmer Shepherd; to Mr. R. W. Paul, M.R.I., and Mr. R. S. Whipple, M.R.I., for their present of auxiliary projection apparatus for the lecture theatre; to Mr. S. G. Brown, M.R.I., for handphone installation and equipment for the lecture theatre; to Mrs. Tyndall, M.R.I., for a silver-plated inkstand, formerly the property of Michael Faraday, and to Mr. L. Rome Guthrie, M.R.I., for Japanese paper for the Ambulatory and for the restoration of early plans of the Institution. Mr. Angus Blue, Mr. P. Dunsheath, Mrs. Frizell, Miss Pomeroy and Professor A. M. Tyndall were elected members.

Development of Analytical Chemistry

Need for a University Chair

AT the December meeting of the London Section of the Society of Chemical Industry, held at Burlington House, Piccadilly, London, on Monday, Mr. J. H. Coste delivered a paper on "Analytical Chemistry: Its Past History and Future Development." Dr. G. T. Morgan, F.R.S. (chairman of the Section), presided.

At the outset, Mr. Coste emphasised the fundamental nature of analysis. It was impossible, he said, to imagine a coherent science of chemistry based on synthesis alone. That certain bodies were related would be known, but we should be in the dark as to the nature of their relationships. Mohr's "Titriermethoden" and Bunsen's "Gasometrische Methoden," which had appeared between 1850–60, had collated what was known in the two great branches of volumetric analysis, and had settled apparently for ever the major methods used in them. The publication of analytical journals had given analysts a chance of forming a literature of their own. Ostwald's "Grundniss" was a great work, explanatory rather than descriptive, which told analysts why they did many things which had long been their habit, and had given, indeed, a "Grundniss" for their practice and beliefs.

A Mass Production Danger

The development of analytical chemistry had followed the lines dictated by necessity and often laid by the hands of craftsmen of unerring instinct rather than by profound thinkers. In a reference to standard methods, Mr. Coste remarked that, although they were necessary for cases in which the chemistry was ill-defined, they were likely to relieve the analyst from the trouble of thinking, and, in fact, of being chemists, thereby making it perfectly legitimate to make analytical chemistry a mass-production industry in which a few qualified gangers only were necessary. It was remarkable, he said, that no university or institution of similar rank in this country had a Professor of Analytical Chemistry, and he believed that very little credit was given, in university examinations, for skill in this direction. The large amount of routine work in an analytical laboratory, he suggested, might, instead of being handed over to persons ignorant of the nature of the operations they carried out, often with great skill, be entrusted to young people who were unable through lack of means to continue day training, but would be glad to acquire responsible experience and some monetary assistance in continuing their studies. In conclusion, Mr. Coste acknowledged the high quality of apparatus available in this country, to which analytical chemistry owed much.

The Discussion

The Chairman said he had long been convinced that analysis was the foundation of all chemistry. He agreed that there should be at least a Lectureship in Analytical Chemistry at our universities, and he testified to the value of the lectures on analytical chemistry which it had been the practice to deliver to many generations of students at the Royal College of Science.

Mr. R. F. Innes, who did not fear that standardisation would lead to our methods becoming too cut-and-dried, said that the leather industry had been forced to adopt standard methods, because discordant results were obtained by different people in the analysis of tanning material.

Dr. J. J. Fox supported the suggestion as to the establishment of a Chair of Analytical Chemistry, and would not be content with a Lectureship. One of his reasons for favouring the establishment of a Chair was that there would also be provided facilities for a year's post-graduate work.

Dr. H. E. Cox complained of the time that was wasted in the re-discovery of methods which had been evolved by others years before, and suggested that this waste of time would be prevented to a large extent if there were a Professor of Analytical Chemistry, who would, among other things, lecture on the history of the subject.

Dr. J. Grant urged the necessity for methods of teaching which would ensure the proper co-ordination of theory and practice in analytical work. Such a course had been established at an evening institute in London.

Mr. Coste said that the course referred to was inaugurated by Mr. Chaston Champman, at the Hackney Technical Institute, and, judging by the syllabus, it was an extraordinarily good one.

The Royal Society

Prince of Wales at 268th Anniversary Dinner

SIR FREDERICK GOWLAND HOPKINS, Professor of Biochemistry in the University of Cambridge, was on Monday elected President of the Royal Society, in succession to Sir Ernest Rutherford, at the 268th anniversary of the Society.

In his anniversary address Sir Ernest Rutherford said the Society had been fortunate in securing the services of a group of men of marked research ability, and the experiment of endowing research professorships had proved an unqualified success. There was undoubtedly a general opinion, however, that at the present time it would not be wise to increase unduly the number of the Society's research professors. There was always the danger that any substantial increase in the near future might lead, in a sense, to the segregation of some of the more vigorous elements in the research life of the universities from that intimate contact with students and inspiration of their work which, in the case of many investigators of the highest rank, was an essential part of their contribution to the advancement of science. The funds held in trust by the Society for the furtherance of research in various branches of science had been very greatly increased during the past 10 years, and now amounted to more than £600,000.

Encouragement of Research

Discussing how some of the accumulated income from these trust funds might be best expended, the President said that the encouragement of research by minor grants for special apparatus and material was, in reasonable measure, provided for by the Government grant, supplemented from the Society's own research funds. The situation was, however, very different in large-scale investigations of a pioneering character, which might require considerable financial support extending over a period of years. Few of the universities or other scientific institutions were sufficiently well endowed to support large-scale researches of this kind, even when the research appeared of marked promise and when the idea and the man were forthcoming. The council of the Society had decided that it could best help the advance of science by assisting major researches of this character.

After careful consideration they were impressed with the fundamental importance of the researches at present being carried on by Dr. Peter Kapitza, F.R.S., at Cambridge, and the need for continuing this work on a more permanent basis. The council had therefore appointed Dr. Kapitza to a Messel Professorship of the Royal Society, and had offered the University of Cambridge £15,000 for the building of a laboratory suitable for his investigations.

The Society's medals were awarded as follows:—The Copley Medal to Sir William Bragg; the Rumford Medal to Professor P. Debye, of Leipzig; Royal Medals to Professor O. W. Richardson and Professor J. E. Marr; the Davy Medal to Professor R. Robinson; the Darwin Medal to Professor J. Schmidt, of Copenhagen; and the Hughes Medal to Sir Venkata Raman, of Calcutta.

The Prince and an Omission

The Prince of Wales was the guest at the 268th anniversary dinner at which Sir Frederick Hopkins took the chair. Replying to the toast of "The Royal Family," the Prince said he understood that was the first occasion on which a Prince of Wales had attended. It was a great privilege to have been able to remedy that omission on the part of his ancestors, who had borne the same title. Since its foundation by Charles II the Society had stood for the promotion of national knowledge, and it was still the chief centre in this country, and one of the oldest and most influential among similar societies throughout the world for the encouragement of the pursuit of scientific knowledge for its own sake. It had been, and was at the present time, a very great help to our industries. Their presidents in the past had been men of the highest possible distinction in the realms of science, and that this tradition was most worthily maintained was proved by the remarkable achievements of his neighbours at that table. He had on his right Sir Ernest Rutherford, their ex-president, who had altered our whole conception of the nature of the material universe by his investigations of radio-activity. Sir Frederick Hopkins was renowned for his pioneer investigations in biochemistry, which had revolutionised our ideas concerning the factors required for health, growth, and nutrition.

The toast of "The Royal Society" was proposed by the Prime Minister, and the President, in reply, suggested that in so far as the Royal Society differed from other academies in the world, it was essentially characteristic of this country and of our race. With regard to the many academies in the world, one felt that they existed, apart from their official functions, for the glorification of the very few; for the manufacture of immortals; for the creation of high priests of science. It had never been the aim of the Royal Society to create a hierarchy of science. It existed for the encouragement of the growth of knowledge, and not for the establishment of authority.

The toast of "The Guests" was proposed by Sir Ernest Rutherford and replied to by Mr. Justice Eve and Sir William Bragg.

Chemical Matters in Parliament

The Dyestuffs Act

Sir H. Cautley (House of Commons, December 2) asked the President of the Board of Trade what was the estimated number of persons who would be thrown out of work by the non-renewal of the Dyestuffs Act, 1920.

Mr. W. Graham: I have seen no estimate of the kind, and I am persuaded that any temporary dislocation that may be occasioned by the lapsing of the Act will be more than balanced by the improvement in the textile industries.

Major Wood asked whether any information showing to what extent during the operation of the Dyestuffs Act textiles had been sent abroad for the purpose of being dyed.

Mr. Graham replied in the negative.

Poison Gas Obligations

Mr. Arthur Henderson (Foreign Secretary) stated in a written reply to Mr. B. Turner that no evidence that the obligations under the Peace Treaties to abstain from the manufacture and importation of poison gases were not being honoured had at any time been supplied to him by the Secretary-General of the League of Nations.

Dangerous Enamel Residue

Cause of a Birmingham Tragedy

REFERENCE to the dangers of nitro-cellulose in enamel residue were made at an inquest held in Birmingham on November 25 into the cause of death of Arthur McCulloch (54), a millwright, who was badly burned while dismantling an enamel spraying plant at vacant premises which had been used by a firm of manufacturers of motor cycle accessories. The plant had been sold at an auction sale, and McCulloch was engaged to dismantle it.

McCulloch's son, who was helping his father, stated that inside the enamelling cabinet was the residue of some stuff which had been used in the enamelling process. It appeared to be of the consistency of treacle. Whilst he had his head inside the cabinet with a view to removing some rivets he believed his father struck a match; there was a sudden flash, a sizzling sound, and the premises took fire.

The former owner of the premises stated that the machinery which was being dismantled had been used in connection with spraying. One of the ingredients in the enamel was nitro-cellulose.

Alfred Hemmings, Inspector of Explosives, said the substance used in the enamelling process was highly inflammable, and while the deposit was fresh it was liable to spontaneous combustion. It was quite possible that a friction spark set the deposit, or residue, alight. Although the substance did not come under the Petroleum Consolidated Act, because it did not actually contain petrol, it was more dangerous than many things that did come under that Act. The stuff gave off a vapour, and a fan was used to disperse it. Witness thought that the residue formed in the air duct of the equipment.

The Coroner, in summing up, said there was a potential danger in the residue, and there were no special regulations by the Home Office dealing with the matter. It seemed to him that regulations should be drawn up dealing with the times and methods of removing this residue from the pans in which it was contained.

The jury, in returning a verdict of "Accidental death," recommended that measures should be taken for the regular disposal of the residue. The coroner added that it was clear that workers did not fully appreciate that there was a potential danger in the residue.

From Week to Week

"Some Curious Things About Metals," was the title of an address delivered by Dr. Walter Rosenhain at the luncheon of the Birmingham Rotary Club on Monday.

The United Chemists' Association, Ltd., pharmaceutical manufacturers, of Cheltenham and London, to celebrate the completion of 21 years of business achievement, has inaugurated a comprehensive group insurance and pension plan for its employees.

Chemical warfare is considered too technical a subject for general discussion at Geneva, and the question of its prohibition has been postponed until the General Disarmament Conference next year, when an expert technical study is to be prepared for the delegates.

Imperial Chemical Industries, Ltd., have started a Christmas gift fund for the benefit of employees of the firm whose services they have had to dispense with during the past year who are still unemployed. The directors have headed the list with a donation of £1,000.

A conference was held at Bradford on Saturday of representatives of seven trade unions covering about 80,000 operatives in the dyeing, finishing, and similar trades, mainly with the object, it was stated afterwards, of forming a constitution to enable the unions to act jointly in the future in any wages negotiations.

A confidential report on the market for polishes and dressings in Turkey has been prepared by the Department of Overseas Trade from information furnished by the Commercial Secretary, His Majesty's Embassy, Istambul. Firms desirous of receiving a copy should communicate with the Department at 35, Old Queen Street, London, S.W.1, quoting reference B.X. 6887.

It is reported in New York, on the authority of an unnamed director of the company that the control of the International Nickel Co. of Canada, Ltd., is now American rather than Canadian or British, the change having come about through a steady accumulation of shares by American investors ever since October of last year. There is no suggestion of any change in the company's management or policy.

All the workers engaged in the dyeing industry of Macclesfield went on strike on Monday night for increased wages. For some months they have been agitating for an increase of 3s. 1d. per week, so as to bring the local rates up to the Yorkshire standard. Negotiations between the parties broke down on the previous Friday, but they are to be reopened, and there are earnest hopes of an early settlement of the dispute.

Three popular chemistry lectures have been arranged by the South Wales section of the Society of Chemical Industry and the Cardiff Technical College Chemical Society, and will be given at the College. On Friday next Mr. H. Ll. Bassett will speak on "Nitrogen in Nature and Industry"; on Monday, December 15, Mr. W. Somerville Vernon will deal with "Liquid Air"; and on the following Friday Mr. John Pryde is taking for his subject "Human Engines."

Lt.-Col. T. S. Morrisey, D.S.O., vice-president and general manager, Combustion Engineering Corporation, Ltd., Canada, an associate of International Combustion, Ltd., has arrived in this country, and is staying at Fleming's Hotel, Clarges Street, Piccadilly, London. Col. Morrisey is severing his connection with Combustion Engineering Corporation, Ltd., at the end of this year in order to join the board of United Engineers and Constructors (Canada), Ltd., and during his visit to this country desires to meet executives of any British industries contemplating the establishment of factories or plants in Canada.

The prosecution ordered by the Stoke-on-Trent Corporation following a number of cases of illness in the Potteries due to the eating of sweets alleged to contain arsenic resulted in the appearance before the magistrate on Saturday of William Ashley, sweet manufacturer, of Waterloo Road, Burslem, and Whitsand Upton, sugar boiler, described as of Albert Street, Tunstall, both charged with powdering the sweets with arsenic. Ashley was fined £15 and Upton £25. Giving his decision, the magistrate said, although it might be said that Upton had no knowledge that the powder might be arsenic, he had no substantial ground for believing it was French chalk.

The arrest is announced from Athens of M. Galopoulos, head of the Greek State Chemical Laboratory, on a charge of being concerned in the production of vast quantities of adulterated quinine.

Mr. Ernest Canning, chairman of W. Canning and Co., manufacturers of chemical and plating equipment and materials, Great Hampton Street, Birmingham, was on Saturday elected a City councillor for Birmingham.

The annual conversazione is being held this evening at the Northampton Polytechnic Institute, St. John Street, London, E.C., and in addition to a concert and athletic programme there will be demonstrations and exhibitions in the various workshops and laboratories.

At a recent meeting of the American Chemical Society, the manufacture of artificial lemon juice out of cane sugar was described by two United States government experts. The cost of producing this juice is stated to be so small that an American company is already manufacturing it in large quantities.

The next meeting of the Chemical Engineering Group will be held jointly with the British Section of the Society of Chemical Industry, on Thursday, in the Chemical Department of the University, Woodland Road, Bristol. A paper on "Modern Water Treatment" will be read by S. Stevens, B.Sc., and will be followed by an informal dinner at 8.30 p.m.

University News.—*Liverpool:* Dr. H. J. Channon, B.R., D.Sc., F.I.C., has been appointed to the Johnston Chair of Biochemistry as from April 1, 1930. Dr. Channon is at present biochemist in the Department of Experimental Pathology and Cancer Research in the University of Leeds, and has published a considerable amount of research work on biochemical problems.

The Ministry of Health is inviting applications for the post of Inspector under the Alkali, etc., Works Regulation Act, 1906. The commencing salary is £500 per annum, plus bonus, rising yearly by £25 to a maximum of £800. Candidates must be science graduates or fellows or associates of the Institute of Chemistry, and preference will be given to those with a working knowledge of chemical processes, in particular of sulphuric acid and alkali manufacture. Further details will be found in our advertisement columns.

Representations have been made to the Board of Trade under Section 10 (5) of the Finance Act, 1926, regarding acid isobutyl allyl barbituric, butyl methyl adipate, calcium gluconate, quinoline, strontium carbonate and strontium nitrate. The section of the Act referred to allows the Treasury to exempt from duty imposed under the Safeguarding of Industries Act, articles which are not made in sufficient quantities in this country or the Dominions. Any communication should be addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, London, within one month.

The ninth Ramsay chemical dinner is being held in the Ca'doro Restaurant, Glasgow, at 6.30 p.m., on Tuesday next, under the chairmanship of Mr. G. C. Clayton, President of the Institute of Chemistry. This dinner, which serves as a memorial to Sir William Ramsay and a reunion of chemists, is held under the joint auspices of the Glasgow sections of the Society of Chemical Industry, the Institute of Chemistry, and the British Association of Chemists, the Scottish section of the Society of Dyers and Colourists, the Institution of the Rubber Industry, the Royal Philosophical Society of Glasgow, the Glasgow University Chemists' Club, the Andersonian Chemical Society, and the Ardeer Chemical Club.

Mr. W. B. Mercer, principal of the Cheshire School of Agriculture, addressing the Shropshire Chamber of Agriculture and the Shropshire Branch of the National Farmers' Union at Shrewsbury on Saturday on the subject of "Recent Advances in Grassland Management," said it would come as a surprise to many to know that there was no proof from any experimental station in England that the application of lime to old pasture land gave a financial return. Professor Crowther (principal of Harper Adams Agricultural College) said he was somewhat startled by Mr. Mercer's observations in connection with the use of lime on permanent grassland, but he had to confess that he knew of no demonstration of the kind that had been carried right through to an economic result. However, the action of lime was very complicated, and he advised its use.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

335,817-8. PYRIDINE DERIVATIVES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, November 26, 1928.

335,817. Pyridine and its homologues are sulphonated using mercury or a mercury salt as catalyst. Examples are given of the treatment of α-picoline with fuming sulphuric acid in the presence of basic mercury sulphate and conversion of the product into calcium and sodium α-picoline-β-sulphonates; and the sulphonation of pyridine using mercury as a catalyst to obtain β-pyridine sulphonic acid.

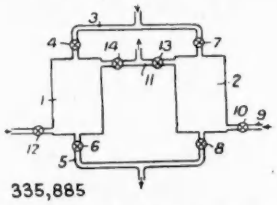
335,818. α-Picoline-β-sulphonic acid is fused with potassium hydroxide to obtain β-hydroxy-α-picoline, which is coupled with diazotised *p*-nitraniline to obtain a dyestuff.

335,863. NAPHTHENATES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, February 22, 1929.

Naphthenic acid is saponified with caustic potash or caustic soda or sodium carbonate and the solution is treated with a soluble alkaline earth or heavy metal salt and the precipitate washed, all at boiling point. The naphthenates of cobalt, manganese, lead, zinc and calcium are obtained by this method.

335,885. PURIFYING LIGHT HYDROCARBONS. R. Scott, Norton Hall, The Green, Norton-on-Tees, Durham, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, May 31, 1929.

Light hydrocarbons from destructive hydrogenation of oil or coal are vaporised and passed at 10 atmospheres pressure

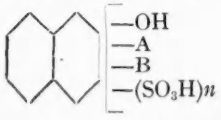


335,885

through bauxite or Fuller's earth. The vapour is passed through tube 3 into a purifying chamber 1 containing bauxite, and thence through tube 5 to the outlet. Bauxite in the chamber 2 is regenerated by passing air at 400°-500° C. through pipe 9 into the chamber, and out through pipe 11. After regeneration, the bauxite in the chamber 2 is employed for purifying, while the bauxite in the chamber 1 undergoes regeneration. Valves 4, 6, 7, 8, 10, 12, 13, 14 are provided so that the gases can be diverted accordingly.

335,893. DYES. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 30, 1929.

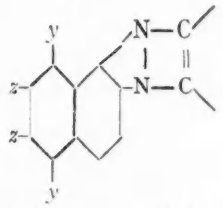
A diamine of the formula NH_2-R-R_1-R-NH_2, in which R is an aromatic and R_1 a hydroaromatic residue which may be substituted or not, is tetrazotized and coupled with 2 molecular parts of the same or different coupling components and of which one may be a monoazo compound or may be diazotized and coupled with a further component. One component may be a naphthol-sulphonic acid of the formula



in which A represents hydrogen, OH, NH_2, O-acyl, NH-acyl, B represents hydrogen, or when A = NH_2, the group (—N=N—aryl) and n = 1 or 2. Examples describe the preparation of the dyestuffs 4 : 4^1-diamino-3 : 3^1-dimethyl-diphenyl-1 : 1^1-cyclohexane ⇉ 2 : 8-dioxynaphthalene-6-sulphonic acid (2 mols.) and several similar compounds; 1-naphthol-3 : 6-disulphonic acid ← 4 : 4^1-diamino-diphenyl-cyclohexane → 1-naphthol-4-sulphonic acid, and several similar compounds; salicylic acid ← 4 : 4^1-diamino-3 : 3^1-dimethyl-diphenyl-cyclohexane → H-acid ← *p*-nitraniline and several similar compounds; 1-napthol-4-sulphonic acid ← 4 : 4^1-diamino-3 : 3^1-dimethyl-diphenyl-cyclohexane → 2 : 8 : 6-acid → β-naphthol; phenol ← 4 : 4^1-diamino-3 : 3^1-dimethoxy-diphenyl-cyclohexane → H-acid → 4-nitro 1 : 3-diaminobenzene; and 4 : 4^1-diamino-3 : 3^1-dimethoxy-diphenyl-cyclohexane → H-acid (1 mol.) ⇉ 4-nitro-1 : 3-diamino-benzene or phenol (2 mols.).

335,896. DYES. W. W. Groves, London. From Soc. of Chemical Industry in Basle, Switzerland. Application date, June 25, 1929.

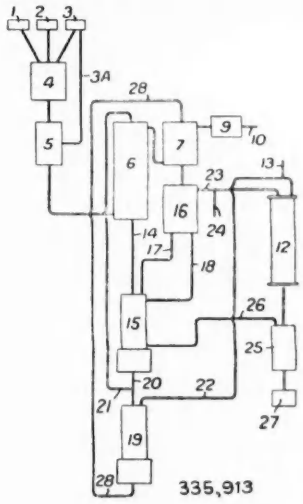
A diazo compound is coupled with an azine of the formula



in which one *y* is an OH group and the other *y* a hydrogen atom, one *z* an SO_3H group and the other *z* a hydrogen atom, the SO_3H and the OH group being in *m*-position to one another, and in which the two carbon atoms belong to an aryl residue which may be substituted. The products are azo dyes for wool, silk, cotton, viscose or varnishes, and are made in substance or on the fibre. The dyestuffs or the dyeings may be treated with metal salts. In an example 2-sulpho-4-oxy-α : β-naphtho-phenazine is coupled with diazotized *o*-anisidine, *p*-nitraniline, sulphanilic acid, *p*-nitraniline-*o*-sulphonic acid or 4-nitro-2-amino-1-phenol-6-sulphonic acid. Several other dyestuffs and their metal compounds are described. The above azines are obtained from N-substituted 2 : 5 : 7- or 2 : 8 : 6-acids by coupling with a diazo compound in an acid medium and decomposing the *o*-aminoazo dyestuff with an acid. Some examples are given.

335,913. UREA. W. W. Triggs, London. From A. B. Lamb, Harvard College, Cambridge, Mass, U.S.A. Application date, June 27, 1929.

Liquid ammonia and liquid carbon dioxide are separately introduced into an autoclave at suitable temperature and



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pressure the melt containing urea is continuously withdrawn, the unconverted ammonia and carbon dioxide are distilled off, separated and liquefied, and returned to the autoclave.

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Coke is treated with air and water in a producer 4 and the gas is treated catalytically in the chamber 5 with steam from pipe 3A, to obtain a mixture of nitrogen, hydrogen and carbon dioxide. This mixture is treated in a scrubber 6 with ammoniacal solution containing the nitrate or chloride, which absorbs some of the carbon dioxide. The gas then passes through scrubber 7 where any ammonia is removed by means of water and oxides of carbon are then removed in a chamber 9. The remaining mixture of nitrogen and hydrogen is converted into ammonia, liquefied and passed through pipe 13, into autoclave 12. The liquor containing carbon dioxide passes from scrubber 6 through pipe 14 to vessel 15, where carbon dioxide is liberated by heat and passes into scrubbber 16, where any ammonia is removed by liquid from scrubber 7. The liquid passes back through vessel 15 and pipe 20 partly to an ammonia still 19 and partly to scrubber 6. Liberated ammonia passes through pipe 22 and a compressor to autoclave 12. Carbon dioxide from scrubber 16 is also liquefied and supplied to autoclave 12. The solution passes to still 25 where ammonia and carbon dioxide are expelled and returned to vessel 15, the urea solution being evaporated in a vessel 27.

335,947. Hydrocyanic Acid. Imperial Chemical Industries, Ltd., T. S. Wheeler, H. A. T. Mills, J. McAulay and W. B. Fletcher, Winnington Hall, Northwich, Cheshire. Application date, March 27, 1929.

Hydrocyanic acid is prepared as described in Specification No. 335,585 (see The Chemical Age, Vol. XXIII, p. 511) by reaction between 1 molecular proportion of ammonia and hydrocarbon gas containing 1 atomic proportion of carbon or less, if the mixture also contains hydrogen.

335,948. Dyes and Halogenated Hydrocarbons. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 3, 1929.

Halogenated isocyclic compounds are obtained by treating isocyclic compounds with hydrochloric or hydrobromic acid or both, in oleum or chlor sulphonic acid, in the presence of sulphur, iodine or other halogen carrier. The halogen hydrides may be formed *in situ* by the addition of sodium chloride or bromide. In an example, dibenzanthrone is treated in chlor-sulphonic acid with hydrogen bromide in presence of antimony to obtain dibromo and higher brominated derivatives. Other examples describe the halogenation of benzanthrone, pyranthrone, 3 : 4 : 8 : 9-dibenzo-pyrene-5 : 10-quinone anthanthrone, etc.

335,962. Methyl Alcohol. H. Dreyfus, 22, Hanover Square, London. Application date, June 5, 1929.

In the synthesis of methanol, the carbon monoxide and hydrogen are passed over zinc oxide with or without chromium oxide, and then over one or more methanol catalysts in a series of chambers, *e.g.*, zinc oxide followed by a mixture of copper and zinc oxides. These are sensitive to sulphur poisoning. About four or five chambers are sufficient to convert all the gas mixture into methanol.

335,965. Synthetic Drugs. A Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 5, 1929.

A polyhydroxy mono- or poly-carboxylic acid of the pentane or hexane series or a salt is treated with iron or an iron compound and then neutralised with a basic substance. Acids employed include pentonic acids such as hexanetetrolic acid, hexonic acids such as gluconic acid, trihydroxyglutaric acids, glucuronic acid and tetra-hydroxyadipic acids. The basic substance may be alkali, ammonia, diethylamine, etc., and the iron compound may be ferrous or ferric hydroxide, or water-soluble salts. Examples describe the preparation of sodium ferrous and ferric gluconates, potassium-sodium ferrous and ferric saccharates, quinine potassium ferrous saccharate and sodium iron mucate.

336,008. Diammonium Phosphate. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, July 10, 1929.

Diammonium phosphate solution is made from phosphoric acid still containing some of the sulphuric acid used in its manufacture, and is then mixed with the dry salt to obtain a moist product which can be dried at 60°–80° C. without loss of ammonia.

336,061. Dyes. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 2, 1929.

A 2-(4¹-hydroxy-arylamino)-6-arylamino-naphthalene is sulphurised with a polysulphide of high sulphur content in presence of a high-boiling fatty alcohol, cyclic alcohol or glycerol to obtain dyes which give bluish to green shades on cotton from a sulphide bath or hydrosulphite vat. Greener shades are obtained by sulphurising in presence of a copper salt. Examples are given.

336,065. Phosphorus Oxychloride. J. S. Dunn and F. Briers, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, September 6, 1929.

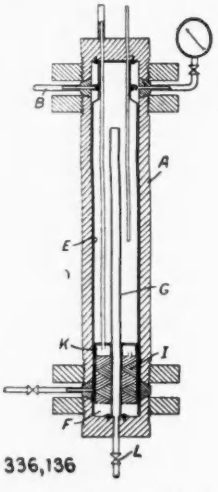
Rock phosphate or double superphosphate is treated with phosgene under such conditions, *e.g.*, grinding or stirring, that fresh surfaces are continually exposed to the gas, and a protective coating of calcium chloride is not formed. The mass is washed with water, dried, and used again. The phosphate may be mixed with carbon activated with chlorine at 1,000° C. in which case chlorine with or without carbon monoxide may be used in place of phosgene.

336,111. Thiourea. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 19, 1929.

Calcium cyanamide in the form of a paste is treated with hydrogen sulphide to obtain thiourea. The paste may be made with water, alcohols, amines, *e.g.*, aniline and alkylamines, esters, *e.g.*, ethyl acetate, pyridine, hydrocarbons or their halogen derivatives. High pressures may be used, and temperatures up to 100° C. The thiourea is extracted by ketones, pyridine and its homologues, or mixtures of alcohols and ethers, benzene, chloroform or carbon tetrachloride. The thiourea is recovered by cooling or evaporation. Examples are given.

336,136. Chemical Apparatus. Imperial Chemical Industries, Ltd., Millbank, London, and K. H. Saunders, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, November 14, 1929. Addition to 329,260. (See The Chemical Age, Vol. XXIII, p. 55.)

Continuous reactions under pressure, *e.g.*, the manufacture of *p*-nitraniline from *p*-chloronitrobenzene and aqueous



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ammonia, are effected in a tube A protected by a stainless steel liner E. Ammonia is supplied at B, passes down over the liner E to the space F and then up through the packing I where it meets the melted *p*-chloronitrobenzene from distributor K. The products overflow through stainless steel tube G.

336,144. Perylene Derivatives. F. Bensa, 6A, Via Serra, Genoa, Italy. International Convention date, December 22, 1928.

A suspension of 4 : 10-dinitroperylene in alcohol and aqueous caustic alkali is heated with an alkali sulphide or hydrosulphide to obtain 4 : 10-diaminoperylene.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention :—316,548 (Chemieverfahren Ges.), relating to working up crude potash salts, see Vol. XXI, p. 314 ; 316,951 (I.G. Farbenindustrie Akt.-Ges.), relating to condensation products from olefines and unsaturated hydrocarbons, see Vol. XXI, p. 338.

Specifications Accepted with Date of Application

313,538. Acylating cellulose. F. G. C. Klein. June 13, 1928.

317,373. Refining of iron or steel. F. Krupp Akt.-Ges. Friedrich-Alfred Hütte. August 14, 1928.

338,108. Carrying out chemical and physical processes. C. H. Lander. May 3, 1929.

338,109. Condensation products from cyclic hydrocarbons, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) May 9, 1929.

338,111. Dyeing of regenerated cellulose materials. Imperial Chemical Industries, Ltd., and R. Brightman. July 3, 1929.

338,126. Hydroxy di- and triaryl-methane compounds, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) August 9, 1929.

338,149. Extraction of tin from ores, alloys, scrap, or the like. Soc. d'Electro-Chimie, d'Electro-Metallurgique, et des Acieries Electriques d'Ugine. June 22, 1929.

338,150. Destructive hydrogenation of carbonaceous liquids, Method and apparatus for. W. R. Tate, H. P. Stephenson, and Imperial Chemical Industries, Ltd. August 13, 1929.

338,152. Valuable condensation products from diolefines, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) May 14, 1929.

338,178. Metallic hydroxides and other metallic compounds, Production of. R. S. Carreras. July 9, 1929.

338,182 and 338,216–7. Anthraquinone-acridone series, Manufacture of dyestuffs of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) July 5 and 6, and August 7, 1929.

338,187. Aliphatic acids, Treatment of. H. Dreyfus. August 12, 1929.

338,192. Valuable liquid products from coal or other carbonaceous materials, Manufacture of. H. D. Elkington. (*Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij.*) August 14, 1929.

338,240. Amino-diphenylamine compounds, Manufacture of. W. W. Groves. (*I.G. Farbenindustrie Akt.-Ges.*) August 27, 1929.

338,262. Styrol and its homologues, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) September 10, 1929.

338,314. Urea derivatives, Manufacture of. W. W. Groves. (*I.G. Farbenindustrie Akt.-Ges.*) October 18, 1929.

338,315. Heat-treating nitrogenised alloy steel articles, Method of. R. Sergeson. October 18, 1929.

338,369. Carbon dioxide, Production of. P. Brotherhood, Ltd., H. M. Dunkerley, and Carbon Dioxide Co., Ltd. November 19, 1929.

338,373. Producing ammonium sulphate by the treatment with gypsum of an ammoniacal solution used for the scrubbing of gases. Union Chimique Belge Soc. Anon. May 17, 1929. Addition to 307,037.

338,409. Iron and iron-nickel and iron-silicon alloys, Manufacture of. Associated Electrical Industries, Ltd. January 18, 1929.

338,412. Anthraquinone derivatives, Manufacture of. Soc. of Chemical Industry in Basle. December 22, 1928.

338,469. Chromates, Manufacture of. Mutual Chemical Co. of America. April 3, 1929.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Bloxam, A. G., and Soc. of Chemical Industry in Basle. Manufacture of artificial materials containing fillers. 35,869. November 28.

Boot's Pure Drug Co., Ltd., and Child, R. Manufacture of derivatives of o.-anisidine, etc. 36,013. November 29.

Bunbury, H. M. Emulsifying agents, etc. 36,018. November 29.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of sulphuric acid. 35,617. November 26.

—— Manufacture of 1 : 7-dihydroxy-naphthalene. 35,882. November 28.

—— Manufacture of 2-hydroxyanthracene-3-carboxylic acid. 35,883. November 28.

—— Manufacture of compounds of anthrapyridine series. 35,998. November 29.

Cullinane, N. M. Production of dyestuff intermediate, etc. 35,708 November 27.

Dryice Corporation of America. Making and shaping solid carbon dioxide. 35,824. November 28. (United States, December 17, 1929.)

Ellis, G. B., and Soc. des Usines Chimiques Rhône-Poulenc. Organic derivative of arsenic. 35,469. November 25.

Fawcett, E. W., Imperial Chemical Industries, Ltd., and Madel, W. R. Manufacture of hydrocarbons, etc., from phenols, etc. 36,019. November 29.

Geigy Akt.-Ges., J. R. Manufacture of polyazo-dyestuffs. 36,016. November 29. (Germany, November 29, 1929.)

Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Manufacture of adenosine triphosphoric acid. 35,344. November 24

—— Manufacture of substituted phenol-carboxylic acids. 35,468. November 25.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Purification of phenols. 35,602. November 26.

—— Manufacture of hydroxy nitriles. 35,603. November 26.

—— Manufacture of acetaldehyde. 35,604. November 26.

—— Hydrogenation of coals. 35,605. November 26.

—— Manufacture of waterproof sheet materials. 35,606. November 26.

—— Imparting a matte appearance to artificial silk. 35,607. November 26.

—— Manufacture of pure iron. 35,719. November 27.

—— Manufacture of hydrocarbons. 35,720. November 27.

—— Manufacutre of alkali metal cyanides. 35,721. November 27.

—— Catalytic splitting off of water. 35,723. November 27.

—— Treatment of fibrous materials, etc. 35,724. November 27.

—— Manufacture of nitrogenous condensation products from acetylene and ammonia. 35,725. November 27.

I.G. Farbenindustrie Akt.-Ges. Manufacture of compounds of dibenzo-pyrenequinone series. 35,345. November 24. (Germany, November 22, 1929.)

—— Manufacture of derivatives of naphthazarin. 35,346. November 24. (Germany, November 23, 1929.)

—— Manufacture of esters of cellulose derivatives, etc. 35,594. November 26. (Germany, November 26, 1929.)

—— Manufacture of 1-phenyl-2-aminoalcohols (1) hydroxylated in the phenyl nucleus. 35,595. November 26. (Germany, November 26, 1929.)

—— Protecting magnesium from attack by heating-baths of saline melts. 35,646. November 26. (Germany, December 11, 1929.)

—— Converting ferro-phosphorous rich in silicon into ferro-phosphorous free from silicon. 35,893. November 28. (Germany, December 17, 1929.)

Imperial Chemical Industries, Ltd. Vulcanisation of rubber, etc. 35,850. November 28.

—— Dye compositions. 36,017. November 29.

International Industrial and Chemical Co., Ltd. Reactions between gases and solids. 35,383. November 24.

Lawrie, L. G. Dye compositions. 36,017. November 29.

Matthews, M. A. Hydrogenating phenols and tar acids. 35,304. November 24.

Metallges. Akt.-Ges. Preparation of phosphorous oxides and acids. 35,955. November 29. (Germany, November 29, 1929.)

Naamlooze Vennootschap Industrieele Maatschappij v.h. Noury and Van der Lande. Grinding organic peroxides. 35,506. November 25 (Holland, December 14, 1929.)

Newall, H. F. Hydrogenating phenols and tar acids. 35,304. November 24.

Pallemaerts, F. A. F., and Union Chemique Belge Soc. Anon. Manufadture of ammonium sulphate. 35,702. November 27.

United Water Softeners, Ltd. Apparatus for testing conditions of liquids. 35,464. November 25.

Physics and Chemistry at "Boston Tech."

PLANS for a new building with unusual provisions for fundamental research and advanced instruction in physics and chemistry at the Massachusetts Institute of Technology are being prepared. Funds for starting the building, which will join two wings of the present building on the east side of the main technology educational group, are available from the gift of $2,500,000 by Mr. George Eastman in 1916, as a supplementary fund for additional educational buildings when needed.

The importance of spectroscopy in the study of atomic and molecular structure which in the next decade seems certain to become the most important agency in chemical research, is recognised in plans for an additional separate spectroscopic laboratory. The equipment of the laboratory includes a collection of the finest instruments which have been gathered at Leland-Stanford University by Professor George R. Harrison, who this year joined the staff of technology as director of the research laboratory of experimental physics. In addition to the proposed physics and chemistry building, plans for a cryogenic laboratory for fundamental studies in the science of low temperatures are under consideration.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID CHROMIC.—1s. per lb., less 2½% d/d U.K.

ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA (ANHYDROUS).—Spot, 11d. per lb., d/d in cylinders.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER, 35/37%.—Spot, £7 10s. per ton d/d station in casks, special terms for contracts.

BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags. carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards).

CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d in drums.

CHROMIUM OXIDE.—9d. to 9½d. per lb. according to quantity d/d U.K.

CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 10s. per ton d/d U.K.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 7d. to 1s. 11d. per gall. pyridinised industrial, 1s. 9d. to 2s. 1d. per gall.; mineralised, 2s. 8d. to 2s. 11d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity; ground ½d. per lb. extra.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

POTASSIUM CHROMATE.—8d. per lb. d/d U.K.

SALAMMONIAC.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE, UNGROUND.—Spot, £3 7s. 6d. per ton d/d station in bulk.

SODA ASH, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.

SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.

SODIUM BICHROMATE CRYSTALS.—3¾d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.b. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM CHROMATE.—3½d. per lb. d/d U.K.

SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d address in bags.

SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton d/d station in drums. Crystals—Spot, £7 10s. per ton d/d station in casks.

SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—5½d. to 7½d. per lb. Crude 60's 1s. 4d to 1s. 6d. per gall. August/December.

ACID CRESYLIC 99/100.—2s. 1d. to 2s. 3d. per gall. B.P., 4s. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Refined, 2s. 3d. to 2s. 5d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 1s. 10d. to 2s. Dark, 1s. 5d. to 1s. 7d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4½d. to 5½d. per gall. 1100, 5½d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 7½d. to 8½d. per gall.; Standard Motor, 1s. 3d. to 1s. 4d. per gall.; 90%, 1s. 4½d. to 1s. 5½d. per gall.; Pure, 1s 7½d. to 1s. 8½d. per gall. (The above prices were operative from October 21 last).

TOLUOLE.—90%, 1s. 8d. to 1s. 10d. per gall. Pure, 1s. 9½d. to 2s. 1d. per gall.

XYLOL.—1s. 4½d. to 1s. 9d. per gall. Pure, 1s. 7½d. to 1s. 11d. per gall.

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, for Export, 6d. to 6⅜d. per gall. Home, 4d. per gall. d/d. Middle oil, 4½d. to 5d. per gall, Standard specification, 3d. to 4d. per gall. Light gravity, 1½d. to 1⅝d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8½d. to 8¾d. per gall. Solvent, 90/160, 1s. 2½d. to 1s. 2¾d. per gall. Solvent, 95/160, 1s. 3½d. to 1s. 5d. per gall. Solvent 90/190, 11d. to 1s. 2d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £3 to £5 per ton. Whizzed, £4 to £5 per ton. Hot-pressed, £8 per ton.

NAPHTHALENE.—Crystals, £10 per ton. Purified Crystals, £14 10s. per ton. Flaked, £11 per ton.

PITCH.—Medium soft, 46s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 6d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID GAMMA.—Spot, 3s. 9d. per lb. 100% d/d buyer's works.

ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.

ACID NAPHTHIONIC.—1s. 5d. per lb. 100% d/d buyer's works.

ACID NEVILLE AND WINTHER.—Spot, 2s. 7d. per lb. 100% d/d buyer's works.

ACID SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8½d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8½d. per lb. d/d buyer's works.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra, d/d buyer's works.

BENZIDINE BASE.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.

BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.

o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1 ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.

p-CRESOL 34·5° C.—1s. 9d. per lb., in ton lots.

DICHLORANILINE.—2s. 5d. per lb.

DIMETHYLANILINE.—Spot, 1s. 8d. per lb., drums extra d/d buyer's works.

DINITROBENZENE.—7½d. per lb.

DINITROCHLORBENZENE.—£74 per ton d/d.

DINITROTOLUENE.—48/50° C., 7d. per lb.; 66/68° C., 7¾d. per lb.

DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

a-NAPHTHOL.—Spot, 1s. 11d. per lb. d/d buyer's works.

B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.

a-NAPHTHYLAMINE.—Spot, 1s. per lb. d/d buyer's works.

B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—5s. 11d. per lb.

m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.

NITRONAPHTHALENE.—9d. per lb.

R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.

SODIUM NAPHTHIONATE.—Spot, 1s. 6½d. per lb. 100% d/d buyer's works.

o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.

p-TOLUIDINE.—Spot, 1s. 9d. per lb. d/d buyer's works.

m-XYLIDINE ACETATE.—3s. 4d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 10s. to £8 per ton. Grey, £14 to £15 per ton. Liquor, 9d. per gall.

ACETONE.—£74 to £75 per ton.

CHARCOAL.—£6 5s. to £8 3s. per ton, according to grade and locality.

IRON LIQUOR.—10d. to 1s. 2d. per gall.

RED LIQUOR.—8d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall., unrefined.

WOOD NAPHTHA, MISCIBLE.—2s. 11d. to 3s. 1d. per gall. Solvent, 4s. per gall.

WOOD TAR.—£4 5s. per ton.

BROWN SUGAR OF LEAD.—£37 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 2d. per lb., according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 8d. to 1s. 10d. per lb.

BARYTES.—£6 to £7 10s. per ton, according to quality.

CADMIUM SULPHIDE.—4s. 6d. to 5s. per lb.

CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.

CARBON BLACK.—3¼d. to 4 1/16d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity. drums extra.
CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 6d. per lb.
INDIARUBBER SUBSTITUTES, WHITE.—4¾d. to 5½d. per lb.; Dark, 4½d. to 5d. per lb.
LITHOPONE, 30%.—£20 to £22 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
VERMILION, PALE OR DEEP.—6s. 6d.–7s. per lb.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£38 5s. per ton, for ½ ton lots, £37 5s. for 1 ton, smaller quantities £39 5s., delivered, barrels free.
ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., for synthetic product, according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 2d. to 1s. 2½d. per lb., less 5%.
ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. to 1s. 0¼d. per lb., less 5%.
AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.
AMMONIUM BENZOATE.—3s. 9d. per lb.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.
ARGENT. NITRAS, CRYSTALS.—1s. 1d. per oz.
ATROPHINE SULPHATE.—8s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BISMUTH CARBONATE.—7s. 6d. per lb.
BISMUTH CITRATE.—7s. 6d. per lb.
BISMUTH SALICYLATE.—7s. 3d. per lb.
BISMUTH SUBNITRATE.—6s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 5s. per lb.
BISMUTH OXIDE.—9s. 6d. per lb.
BISMUTH SUBCHLORIDE.—8s. 9d. per lb.
BISMUTH SUBGALLATE.—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0¼d. per lb.; 12 W. Qts. 11¼d. per lb.; 36 W. Qts. 11d. per lb. Liquor Bismuth B.P., in W. Qts., 1s. 2d. per lb.; 6 W. Qts., 11½d. per lb.; 12 W. Qts., 10d. per lb.; 36 W. Qts., 9½d. per lb.
BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 4½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 7d. per lb. Prices for 1-cwt. lots.
CAFFEIN, PURE.—6s. 6d. per lb.
CAFFEIN CITRAS.—5s. per lb.
CALCIUM LACTATE.—B.P., 1s. to 1s. 6d. per lb., in 1-cwt. lots.
CAMPHOR.—Refined flowers, 2s. 10d. to 3s. per lb., according to quantity; also special contract prices.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
EMETINE HYDROCHLORIDE.—58s. 6d. per oz.
EMETINE BISMUTH IODIDE.—33s. per oz.
EPHEDRINE, PURE.—12s. 6d. to 13s. 6d. per oz.
EPHEDRINE HYDROCHLORIDE.—9s. 9d. to 10s. 6d. per oz.
EPHEDRINE SULPHATE.—9s. 9d. to 10s. 6d. per oz.
ERGOSTEROL.—2s. 6d. per gm.
ETHERS.—S.G. ·730—1s. to 1s. 1d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—27s. 6d. per oz.
HYDRASTINE HYDROCHLORIDE.—85s. per oz. for small quantities.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; fo r28-lb. lots.
IRON AMMONIUM CITRATE.—B.P., 2s. 2d. per lb., for 28-lb. lots. Green, 2s. 9d. per lb., list price. U.S.P., 3s. per lb. list price.
IRON PERCHLORIDE.—18s. to 20s. per cwt. according to quantity.
IRON QUININE CITRATE.—B.P., 8¼d. to 8¾d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 14s. 3d. per lb. net; Synthetic, 8s. 6d. to 10s. 6d. per lb.; Synthetic detached crystals, 8s. 6d. to 10s. 3d. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.
PILOCARPINE NITRATE.—10s. 6d. per oz.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—88s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 1s. 10d. to 2s. 3d. per lb.
POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.
POTASSIUM IODIDE.—16s. 8d. to 17s. 9d. per lb., as to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1 cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.
QUINOPHAN.—B.P.C., 14s. 6d. to 16s. 6d. per lb. for cwt. lots.
SACCHARIN.—43s. 6d. per lb.
SALICIN.—18s. 6d. per lb.
SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.
SODIUM BENZOATE B.P.—1s. 9d. per lb. for 1-cwt. lots.
SODIUM CITRATE.—B.P.C. 1911, 1s. 6d. to 1s. 11d. per lb. B.P.C. 1923, and U.S.P., 1s. 10d. to 2s. 3d. per lb.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—85s. to 90s. per cwt. net. Crystals, 2s. 6d. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
STRYCHNINE, ALKALOID CRYSTAL, 2s. per oz.; hydrochloride, 1s. 9½d. per oz.; nitrate, 1s. 8d. per oz.; sulphate, 1s. 9d. per oz., for 1,000-oz. quantities.
TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
THYMOL.—Puriss, 7s. 3d. to 8s. per lb., according to quantity. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—11s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL CINNAMIC ALDEHYDE.—9s. 6d. per lb.
AMYL SALICYLATE.—2s. 6d. per lb.
ANETHOL (M.P. 21/22° C.).—6s. 3d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d. per lb
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.
COUMARIN.—12s. per lb.
CITRONELLOL.—7s. 6d. per lb.
CITRAL.—7s. 6d. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—8s. 9d. per lb.
GERANIOL (PALMAROSA).—17s. per lb.
GERANIOL.—7s. 6d. to 10s. per lb.
HELIOTROPINE.—6s. per lb.
ISO EUGENOL.—10s. 9d. per lb.
LINALOL, EX BOIS DE ROSE.—6s. per lb. Ex Shui Oil, 6s. per lb.
LINALYL ACETATE, EX BOIS DE ROSE.—8s. 6d. per lb. Ex Shui Oil, 8s. 6d. per lb.
MUSK KETONE.—30s. per lb.
MUSK XYLOL.—6s. 3d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—9s. per lb.
RHODINOL.—44s. per lb.

(*Essential Oils on page 537.*)

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co. Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

THERE has been a maintenance of the better inquiry for the bulk of the Industrial Chemicals and prices on the whole continue firm. Export trade has been better than for some time.

General Chemicals

ACETONE.—Unchanged at £71 10s. to £80 per ton according to quantity and there is a fair demand.

ACETIC ACID.—Continues along quietly steady lines with the price unaltered at £36 5s. to £38 5s. per ton for Technical 80% and £37 5s. to £39 5s. per ton for pure 80%.

ACID CITRIC.—No further weakness has developed although price is still a little unsteady at about 1s. 3d. per lb. ex wharf London. There is only a small demand.

ACID FORMIC.—In rather better request with the price firm at about £38 per ton for 85%.

ACID LACTIC.—Receiving a good demand with the price showing no change at £41 to £42 per ton for 50% by Weight, pale quality.

ACID OXALIC.—Firm at £30 7s. 6d. to £32 per ton, according to quantity and there is substantial business passing.

ACID TARTARIC.—Firmer conditions are now being felt and prices are quoted from 1s. to 1s. 1d. per lb., less 5%.

ALUMINA SULPHATE.—Steady at about £7 15s. to £8 5s. per ton, according to quantity this being for 17/18% iron free quality and there is an active demand.

ARSENIC.—In rather short supply for early delivery and the market is firm at £19 to £19 10s. per ton.

CREAM OF TARTAR.—Unchanged at about 88s. per cwt., ex warehouse London with a somewhat better demand.

COPPER SULPHATE.—An improved demand is making itself felt and prices are firm at about £22 to £22 10s. per ton less 5%, free on rails London.

FORMALDEHYDE.—In steady request at about £32 per ton, ex warehouse London.

LEAD ACETATE.—Slightly firmer with the demand broadening. Current prices are £35 15s. per ton for white and £34 15s. per ton for brown.

LEAD NITRATE.—In steady request at about £29 10s. per ton.

LITHOPONE.—Has been in quite good request and prices have been quoted a little lower at about £18 to £20 per ton according to grade and quantity.

POTASSIUM BICHROMATE.—Prices have been slightly advanced and is quoted at 4¼d. per lb. less usual discounts for contract quantities.

POTASSIUM CARBONATE.—In small request at about £28 to £29 per ton for 96/98% Arsenic free quality.

PERMANGANATE OF POTASH NEEDLE CRYSTALS B.P.—In regular and steady request at 5½d. per lb.

SODIUM BICHROMATE.—Prices have been slightly advanced and are now 3¾d. per lb. with usual discounts for contracts and there is a good demand.

SODA CHLORATE.—The market is firm especially for forward delivery with spot material being quoted at about £25 per ton.

SODIUM HYPOSULPHITE.—Prices are unchanged at £8 10s. for Commercial Crystals with Photographic Crystals in only quiet request at about £14 5s. per ton.

SODIUM SULPHIDE.—Prices remain unchanged at £10 5s. to £11 5s. for solid, broken £1 per ton extra, carriage paid.

TARTAR EMETIC.—A small business is being done at about 11d. per lb.

ZINC SULPHATE.—Quoted slightly lower at £11 to £11 10s. per ton.

Coal Tar Products

Prices and conditions are unchanged from last week, and it is becoming difficult to get quotations for any coal tar by-products, owing to the unrest in the coalfields.

MOTOR BENZOL.—Quoted at about 1s. 5½d. to 1s. 6½d. per gallon, f.o.r.

SOLVENT NAPHTHA.—Unchanged, at about 1s. 2½d. to 1s. 3d. per gallon.

HEAVY NAPHTHA.—Remains at about 1s. 1d. per gallon f.o.r.

CREOSOTE OIL.—Unchanged, at 3d. to 3¼d. per gallon f.o.r. in the North, and at 4d. to 4¼d. per gallon in London.

CRESYLIC ACID.—Quoted at 1s. 8d. per gallon for the 98/100% quality, and at 1s. 6d. per gallon for the dark quality 95/97%.

NAPHTHALENES.—Remain at £3 10s. to £3 15s. per ton for the fire-lighter quality, at about £4 to £4 5s. per ton for the 74/76 quality, and at about £5 per ton for the 76/78 quality.

PITCH.—Quoted at 37s. 6d. to 42s. 6d. per ton, f.o.b. East Coast port.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—*Export.*—During the week the prices remained unchanged at £7 to £7 5s. per ton f.o.b. U.K. port in single bags. There seems very little interest in this product at the moment. *Home.*—The home market continues quiet with producers offering at fixed prices.

NITRATE OF SODA.—New York reports that exceptional dullness continues in the U.S.A. market. In European countries the buyers are also continuing to hold off.

Latest Oil Prices

LONDON, December 3.—LINSEED OIL was fully steady at 7s. 6d. to 5s. advance. Spot, £27 10s.; December, £24; January-April, £21 15s.; May-August, £20 15s.; September-December, £21 10s., naked. RAPE OIL was steady. Crude, extracted, £31; technical refined, £32 10s., naked, ex wharf. COTTON OIL was steady. Egyptian crude, £23; refined common edible, £28; deodorised, £30, naked, ex mill. TURPENTINE, was quiet and 6d. to 3d. per cwt. lower. American, spot, 34s. 6d.; January-April, 35s. 9d.; Russian, spot, 31s. 9d.

HULL.—LINSEED OIL, naked, closed at £24 5s., for spot; December, £23 5s.; January-April, £22 5s.; May-August, £21 5s.; East Indian, spot, £25 15s.; Baltic, spot, £28. COTTON OIL, naked, Egyptian crude, spot, £23; edible refined, spot, £25 10s.; technical, spot, £25 5s.; deodorised, spot, £27 10s. PALM KERNEL OIL.—Crude naked, 5½ per cent., spot, £25. GROUNDNUT OIL.—Crushed-extracted, spot, £28 10s.; deodorised, spot, £32 10s. SOYA OIL.—Extracted and crushed, spot, £25; deodorised, spot, £28 10s. RAPE OIL.—Crushed-extracted, spot, £30; refined, spot, £32 per ton. TURPENTINE, CASTOR, and COD unaltered.

South Wales By-Products

THERE is very little change in South Wales by-product activities. The pitch demand has strengthened, but business remains unsatisfactory, the big users buying only for immediate requirements. Stocks, consequently, remain well in excess of demand. There is no change in values. Road tar has a fair call round about 13s. per 40-gallon barrel. Solvent naphtha is slightly better, but heavy naphtha has scarcely any call. Values are unchanged. Refined tars continue to have a steady, moderate demand, with quotations for coke-oven and gasworks tar unchanged. Creosote remains a weak feature, but motor benzole is in good demand. Patent fuel and coke exports are better, and there are indications that the long-expected improvement is near setting in. Patent fuel prices, for export, are as follows: 21s. 6d., ex-ship Cardiff; 20s., ex-ship Newport; 20s., ex-ship Swansea. Coke prices are: Best foundry, 34s. to 36s. 6d.; good foundry, 26s. to 30s.; furnace, 17s. 6d. to 21s. 6d.

Scottish Coal Tar Products

WITH stocks increasing and orders very scarce it is considered to be not unlikely that lower prices would be accepted for reasonably large orders. Quotations in most departments are unchanged, however, excepting cresylic acid, which is a fraction lower.

Cresylic Acid.—Large quantities are available and values are lower. Pale 99/100%, 1s. 7d. to 1s. 8d. per gallon; pale 97/99%, 1s. 6d. to 1s. 7d. per gallon; dark 97/99%, 1s. 5d. to 1s. 6d. per gallon; all f.o.r. in bulk. High boiling acid is unchanged at 1s. 7d. to 1s. 9d. per gallon.

Carbolic Sixties.—Price remains nominal at about 1s. 10d. per gallon for "under 5% water" qualities.

Creosote Oil.—Trading has been slower during the week, but values are unchanged. Specification oil, 2¾d. to 3d. per gallon; gas works ordinary, 3¼d. to 3¾d. per gallon; washed oil, 3d. to 3¼d. per gallon; all ex works in bulk.

Coal Tar Pitch.—Orders would be welcomed, but buyers are uninterested. The export price is 42s. 6d. to 45s. per ton, f.a.s. Glasgow, and home value is about 45s. per ton, f.o.r.

Blast Furnace Pitch.—Continues quiet at 30s. per ton, f.o.r. works for home trade, and 35s. per ton, f.a.s. Glasgow for export.

Refined Coal Tar.—The forward position continues to attract attention. Value is easy at 3d. to 3¼d. per gallon naked, f.o.r.

Blast Furnace Tar.—Dull at 2¾d. per gallon, fo.r.

Crude Naphtha.—Production is low and value is steady at 4d. to 4¼d. per gallon at makers' works.

Water White Products.—This market continues very quiet. Motor benzole, 1s. 4d. to 1s. 4½d. per gallon; 90/160 solvent, 1s. 2d. to 1s. 3d. per gallon; 90/190 heavy solvent, 1s. to 1s. 0½d. per gallon; all in bulk quantities, ex makers' works.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.

Glasgow, December 2, 1930.

THE Scottish heavy chemical market remains steady, the volume of business showing no further improvement.

Industrial Chemicals

ACETONE.—B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £47 to £58 per ton; pure, £37 5s. per ton; technical, 80%, £36 5s., delivered in minimum lots of 1 ton.

ACID, BORIC.—Granulated commercial, £22 per ton; crystals, £23; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1-cwt. bags, delivered free Great Britain in one-ton lots upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads.

ACID, OXALIC.—98/100%.—On offer at the same price, **viz.**: 3½d. per lb., ex store. On offer from the Continent at 3½d. per lb., ex wharf.

ACID, SULPHURIC.—£3 2s. 6d. per ton, ex works, for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC, B.P. CRYSTALS.—Quoted 11½d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted at round about £8 15s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10¼d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £30 per ton, ex wharf. On offer for shipment from China at about £28 per ton, c.i.f. U.K.

ARSENIC, WHITE POWDERED.—Quoted £19 per ton, ex wharf, prompt shipment from mines. Spot material still on offer at £20 5s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £10 10s. per ton, c.i.f. U.K. ports. For Continental materials our price would be £10 per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 15s. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r. works, or at £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £33 per ton, ex store. Continental on offer at about £32 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £33 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £46 per ton, carriage paid.

LEAD, ACETATE.—White crystals quoted round about £38 to £39 per ton ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE.—GROUND CALCINED.—Quoted £9 per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 o.p. quoted 1s. 8d. per gallon less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4¼d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £25 10s. per ton ex store. Offered from the Continent at £24 15s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100% POWDER.—Quoted £25 per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb ex wharf.

SODA CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums, all carriage paid, buyer's station, minimum four-ton lots. For contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3½d per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £9 15s. per ton, carriage paid, buyer's sidings, minimum six-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices, 55s. per ton, ex works; 57s. 6d. per ton, delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £18 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

(Continued from page 535.)

Prices of Essential Oils

BERGAMOT OIL.—8s. 9d. per lb.
POURBON GERANIUM OIL.—16s. 6d. per lb.
CINNAMON OIL LEAF.—6s. 3d. per oz.
CLOVE OIL, 90/92%.—8s. 3d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, 9s. 9d. per lb.
LEMON OIL—4s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 10s. per lb.

"Account Rendered" Reaches the Workshop

Read by Rank and File of Industry

IT is not often that a serious study of the economic state of the nation receives so instant a welcome as that accorded to "Account Rendered (1900–1930)," Sir Ernest Benn's new work. Its defence of economy and the independent spirit has begun to take effect, and has stirred and heartened sane thinkers. The book has caught the country in a mood of doubt and pessimisim, and shown a way out that may be taken with certainty and confidence. Perhaps one of the most significant facts about "Account Rendered" is the appeal it is making to the British worker. Copies are going into works libraries up and down the country and the author's words are being read by the rank-and-file of industry—heirs to the tradition set up when the words "British workmanship" were a passport to world markets. Among many other enthusiastic expressions of opinion is one from a well-known public man who writes: "It would be a very good thing for the country if every member of the House of Commons was compelled to read 'Account Rendered,' and in addition, to write, say, a 200 word account of its contents and conclusions."

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, December 4, 1930.

A certain amount of interest in the chemical market has been aroused by the announcement of new contract prices in respect of some products for delivery over next year, and a moderate volume of forward buying has been reported. In other respects the market during the past week has not been particularly brisk, conditions at the consuming end, with few exceptions, not being such as to tempt users to enter into extensive commitments. In consequence, much of the current business is for small lots for near delivery dates, although values keep reasonably steady in most sections.

Heavy Chemicals

A moderate trade is passing in bicarbonate of soda, which is quoted at round £10 10s. per ton. Caustic soda is in fair request, with offers ranging from £12 15s. to £14 per ton, according to grade. Not a great deal of interest has been shown this week in the case of phosphate of soda, the dibasic quality being quoted at from £10 to £10 10s. per ton. A quiet trade is passing in Glauber salts and salt-cake, both of which are in the neighbourhood of £3 per ton. Chlorate of soda is moving in moderate quantities, with values at about £23 10s. per ton. Alkali is steady at £6 per ton and a fair amount of business is going through. Offers of prussiate of soda continue at from 4¾d. to 5¼d. per lb., according to quantity. There is some inquiry about for hyposulphite of soda, the commercial grade being quoted at from £9 to £9 10s. per ton and the photographic at about £15. A quietly steady trade has been reported in respect of bichromate of soda, current delivery being quoted on the basis of 3⅜d. per lb. Sulphide of sodium is not attracting a great deal of attention just now, but there has been little alteration in the price position of this material, the 60–65 per cent. concentrated solid quality being on offer at up to £9 per ton, with the commercial grade quoted at round £8.

Among the potash products, permanganate meets with only a moderate demand and the commercial quality is obtainable at from 5d. to 5¼d. per lb. and the B.P. at about 5½d. Chloride of potash shows little change on balance at £10 per ton, with sales rather slow. Caustic soda is quoted here today at round £29 per ton. Prussiate of potash is in quietly steady call, with the yellow material offering at from 6¾d. to 7¼d. per lb., according to quantity, and the red at about 1s. 8d. Sulphate of potash keeps up at round £11 per ton, and a moderate business is passing. Chlorate of potash is only in quiet demand at the moment but values keep up at £25 per ton. Carbonate of potash meets with some inquiry and prices are held at about £25 per ton. Bichromate of potash continues to be quoted on the basis of 4¼d. per lb.

Offers of English arsenic are still relatively scarce and prices keep up at round £18 10s. per ton, at the mines, for white powdered, Cornish makes. Sulphate of copper meets with some inquiry and quotations seem fairly steady at about £21 10s. per ton, f.o.b. There is still not much business being done in the case of the acetates of lime, with the brown quality at £7 10s. per ton and the grey at from £14 to £14 10s. The lead products continue rather quiet but there has been no further change in prices, nitrate selling at round £29 10s. per ton, and brown and white acetate at £34 10s. and £35.

Acids and Tar Products

A moderate trade is passing in tartaric acid, current offers of which are at up to 1s. 1d. per lb. Citric acid is quiet but at about 1s. 5½d. per lb., there has been little change in price levels. Oxalic acid keeps up at round £1 12s. per cwt., without, however, attracting very much attention. Acetic acid is in quiet demand at the moment, but values are held at £37 per ton for the 80 per cent. commercial grade, and from £47 to £51 for the glacial.

In the by-products section, pitch prices vary from 42s. 6d. to 47s. 6d. per ton, f.o.b., with the demand no better than before. There is a moderate trade going through in creosote oil, prices of which are at 3¼d. to 4¼d. per gallon, naked, according to gravity. Interest in carbolic acid is poor and values are easy at about 5½d. per lb., f.o.b., for crystals, and 1s. 6d. per gallon, naked, for 60's crude. Solvent naphtha is well held at round 1s. 3d. per gallon, and it is reported that parcels are not too freely obtainable.

Company News

Explosives and Chemical Products.—A dividend of 16⅔ per cent., tax free, is announced on the ordinary shares.

New Tamarugal Nitrate Co.—Coupon No. 28 for full interest to July 31, 1930 (4 per cent.) on income bonds is to be paid (less tax) on January 1.

Chloride Electrical Storage Co., Ltd.—The directors announce an interim dividend of 5 per cent., tax free, on the "A" and "B" ordinary shares.

Broughton Copper Co.—The directors state that they are unable to recommend the payment of the half-yearly preference dividend due on December 1.

British Tar Products.—For the year to September 30, the report states that the profit was £46,414. After payment of dividends on the preferred ordinary and ordinary shares of 10 per cent., plus a bonus of 5 per cent., there remains £1,172 to be carried forward.

Lautaro Nitrate Co., Ltd.—The report for the year ended June 30 last states that gross profits obtained from the sales of nitrate, iodine, etc., were £747,815, against £963,772 a year ago. After providing for general expenses, oficina closing and stoppage expenses, taxes and interest on advances amounting in all to £297,008, interest on debentures £141,207, repairs £22,263, and depreciation £254,794, there is a net profit of £32,542, in contrast with £294,852. Adding the balance carried forward, and deducting the amount of dividend number 66 on Preferred shares, £280,000, there remains £402,299 to be carried forward.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal" have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

Mexico.—A resident in Mexico is desirous of importing machinery for the manufacture of calcium superphosphate from bone and by-products thereof. The plant should have a capacity of from 5 to 8 tons daily. The product obtained is to be used as a fertiliser. (Ref. No. 497.)

Uruguay.—The State Electricity Board is calling for tenders, to be presented in Uruguay by January 15, 1931, for the supply and delivery of an outfit for the centrifugal purification of fuel oil for use in boilers, capable of dealing with 20,000 kilograms of oil per day of eight hours' continuous working. The plant required is to consist of at least two separating machines with their electric motors, rotary or centrifugal pumps direct coupled to electric motors for pumping the oil before and after purification, two tanks, piping and accessories. (Ref. A.X. 10,528.)

Tariff Changes

Norway.—A Royal Resolution regarding the production, importation into and sale in Norway of isopropyl alcohol, provides that this may only be produced by persons who have received a special permit from the Ministry of Finance and Customs. The right to import and sell isopropyl alcohol is vested in the Vinmonopolet, and sales may only take place for technical, scientific and medicinal purposes.

Switzerland.—The Customs duties on aluminium, aluminium alloys and certain aluminium wares have been increased as from November 18. That on pure aluminium, in lumps, ingots, cast slabs, tars and scrap has been raised from 5 to 65 francs per 100 kilogs.

Yugoslavia.—Light coal tar oils such as benzol, toluol and xylol, formerly free, are now subject to an import duty of 44 gold dinars per 100 kilogs, but oils imported for the use of the Ministry of War and Marine or for chemical manufacture, may be imported duty-free under regulations laid down by the Minister of Finance.

Society of Glass Technology

Joint Meeting with Ceramic Society

THE Society of Glass Technology held a joint meeting recently with the (English) Ceramic Society, at Stoke-on-Trent, four papers being presented.

The first entitled "The Structure of Glasses: Evidence of X-Ray Diffraction," by J. T. Randall, H. P. Rooksby, and B. S. Cooper, stated that a number of clear glasses showing no visual signs of devitrification had been examined by means of X-rays, for evidence of incipient crystallinity. The general conclusion was that many glasses do consist of extremely small crystals, the order of size being 10–6 to 10–7 cm. Vitreous and amorphous silica consisted largely of cristobalite crystallites of size about 1·5 to 2·0 by 10–7 cm. The distribution of particle size was not simple. The crystallites probably consisted of at least two groups, one having a much bigger average size than the other. Wollastonite glass in all probability consisted of crystallites of pseudo-wollastonite, the hexagonal crystal formed at high temperature, and of the same order in size as the vitreous silica crystallite. Sodium borate glass consisted of small crystallites of $Na_2B_4O_7$.

A commercial hard glass containing 70 per cent. SiO_2, and 17 per cent. B_2O_3, was found to contain a large proportion of the silica as cristobalite crystallites. The presence of cristobalite crystallites in a glass depended upon the nature of the oxides other than silica, rather than on the proportion of silica present. One glass of percentage composition 70 SiO_2, 17 Na_2O, 5 CaO, 4 MgO, gave an X-ray pattern quite different. The oxides of boron and aluminium did not appear to combine with silica, whereas the oxides of the strongly electro-positive elements calcium and sodium did thereby destroying the silica lattice. Strained and unstrained glasses gave identical patterns. The authors regarded the term "amorphous" as having little meaning. Amorphous bodies and glasses were both really crystalline.

Specifications for Tank Blocks

"Specifications for Tank Blocks," by W. J. Rees, B.Sc.Tech., F.I.C., examined the *Provisional Specification for Glassworks Refractories*, as prepared in 1919 by the Refractories Committee of the Society of Glass Technology in the light of the greater amount of useful data and experience now available. In regard to tank blocks the experimental and practical evidence of the last ten years had probably shown that the recommendation to use aluminous clays had been a sound one. In general, the experience under the intensive modern methods of glass production in tank furnaces had confirmed the advantage of the use of clays of high alumina content. Possible exceptions might arise in tanks melting glasses rich in boric acid. The successful application of refractories prepared from natural sillimanite, cyanite, or andalusite, or synthetic mullite emphasised the effect of "mullite" content in promoting chemical resistance. The "Recommendations and Suggestions" appended to the *Specifications* had been very helpful in that they had aroused much criticism and discussion. The suggestions with regard to the methods of use of tank blocks had been largely adopted by glass manufacturers. A standard specification and its concomitant standard methods of testing which would be internationally acceptable to glass and refractories manufacturers was a conclusion worth striving for.

Casting of Refractories

"Notes on the Casting of Refractories," by W. Emery, gave consideration to two main classes of slip, namely, (1) those containing fairly high proportion of large grained non-plastics, such as are used often for the making of gas retorts, and (2) those in which the non-plastics are in moderately fine grains. Experiments undertaken by the author to explore the possibility of casting horizontal fireclay gas retorts were described, the work embracing both the laboratory and the works sections. The effects of various deflocculants on the suspending power of the slip, and modifications of the blunging process were tested. Soda silicate 100° T., and soda carbonate were used as liquifying agents in the laboratory tests and later, a mixture of these two materials in the ratio of 2 : 1 was used as deflocculant in the large scale work. Finally retorts measuring 5 ft. by 2 ft. 4 in. by 2 ft. were cast, dried, and burned satisfactorily. Tests made in different laboratories on portions cut from a specimen showed

(*Continued from previous column.*)

a maximum variation of 0·8 per cent. in porosity, and a maximum difference of 0·03 per cent. in the after-contraction.

This experimental work showed that, using alkaline deflocculants only, it would be possible to produce goods in many respects superior to those obtained from the same mixes, hand moulded; and that when the upper limit of grog content possible with plastic pressing was reached, the casting process enabled further additions of non-plastics to be incorporated and if need be, they could be of much larger size. The author was assured that for certain designs of saggars used in the sanitary trade, casting was cheapest. The process also found use in the production of supporting slabs, and certain intricate sections of combustion zones of tunnel kilns.

The Plasticity of Clays

"A Method for the Measurement of Plasticity of Clays, and Some Applications," by E. J. C. Bowmaker, B.Sc., described a modification of the method of Dr. K. Pfefferkorn, applied to the determination of the plasticity of many and varied samples of clay.

Imperial Chemical Industries, Ltd.

THE directors of Imperial Chemical Industries, Ltd., announce that they have made an offer for all the outstanding Preference and Ordinary shares of Lighting Trades, Ltd. Lighting Trades, Ltd., which is already controlled by Imperial Chemical Industries, has an authorised and issued capital of £189,024, of which £171,374 is in 10s. Preference shares, the balance being in 1s. Ordinaries, and is engaged in the manufacture of gas mantles, etc.

It is also announced during the week by Elliott's Metal Co., Ltd., that Imperial Chemical Industries (the controlling company) has made an offer to the Preference shareholders: For every six 5 per cent. Cumulative Preference £1 shares, Imperial Chemical offers five 7 per Cent. Cumulative Preference £1 shares. Imperial Chemical reserves the right to withdraw its offer if not accepted on or before December 31 next by 90 per cent. of the issued Preference shares. The parent company further offers to purchase for cash all Elliott's Metal outstanding 4 per Cent. Debenture stock at the rate of £80 per £100 stock.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette, &c.

Companies Winding Up

RHODESIA BORDER MINING CORPORATION, LTD. (C.W.U., 6/12/30.) Winding-up order, November 24.

VULCAN COPPER MINES, LTD. (C.W.U., 6/12/30.) Winding-up order, November 24.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

LIME-FREE WATER AND GENERAL SERVICES, LTD., London, W.C. (M., 6/12/30.) Registered November 19, series of £20,000 (not ex.) debentures, present issue £14,650; general charge. *Nil. October 21, 1929.

Satisfactions

AFRICAN MANGANESE CO., LTD., London, E.C. (M.S., 6/12/30.) Satisfaction registered November 19, £25,000, part of amount registered April 13, 1923.

ALUMINIUM CORPORATION, LTD., London, S.W. (M.S., 6/12/30.) Satisfaction registered November 21, £6,000, registered May 20, 1921.